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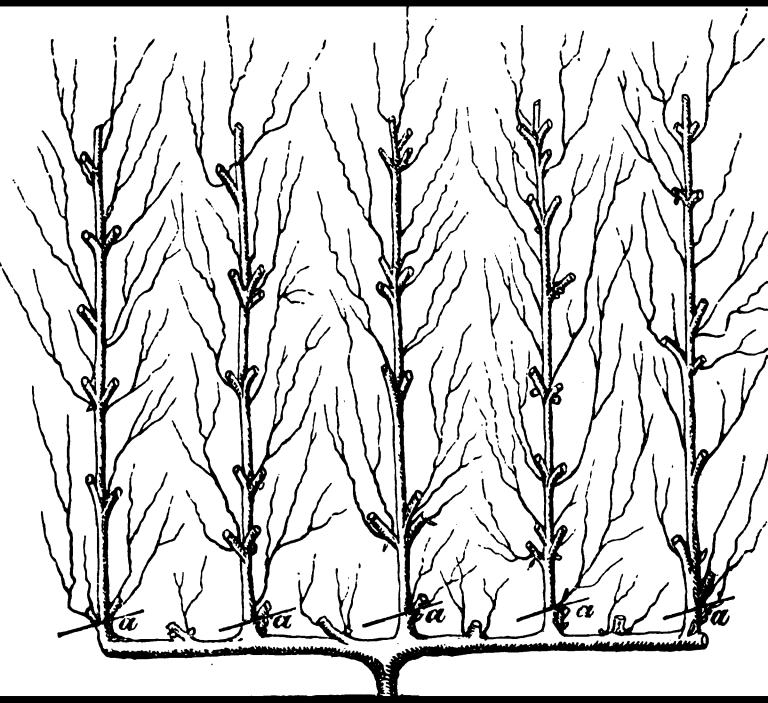

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THE TREE PRUNER

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THE TREE PRUNER

BEING A PRACTICAL MANUAL ON

THE PRUNING OF FRUIT TREES

INCLUDING ALSO THEIR TRAINING AND RENOVATION, WITH THE BEST METHOD OF BRINGING OLD AND WORN-OUT TREES INTO A STATE OF BEARING

ALSO TREATING OF THE

PRUNING OF SHRUBS, CLIMBERS, AND FLOWERING PLANTS

WITH NUMEROUS ILLUSTRATIONS

By SAMUEL WOOD

AUTHOR OF "GOOD GARDENING," "MULTUM IN PARVO GARDENING," "THE GARDEN OF BULBS," "THE TREE PLANTER AND PLANT PROPAGATOR," ETC.

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INTRODUCTORY REMARKS.

It is now upwards of forty years since I was put to the pruning and training of the Peach, and other fruit-trees, and more than thirty-six years since I was called upon by a gentleman to renovate a set of wall trees which had gone into a state of dilapidation. Said he, "Do you think you can make anything of them?" I replied that I could do so, and may say, without boasting, that I did do so, to his astonishment.

The inducements I have had to write this work have been various. I know that there have been many who have given directions how to prune the Peach, &c., but their works are either too deficient in illustrative examples, or so elaborate as to be beyond the reach of most of the young men who are trying to learn this essential branch of good gardening. Few among our young men can now afford to give so much as thirty, twenty, or even fifteen shillings for such a book.

One great reason I had for writing this book was the miserable and defective method of pruning generally adopted nowadays. I see this almost everywhere I go, and deplore it. I have a garden now under my care, with a splendid brick wall 400 feet long planted with Peaches, which has been managed by several professional gardeners, not one of whom, however, knew how to prune a Peach. I see from the trees on this long wall that men may know how to plant and grow a tree, but that there are comparatively few who can prune well, or perhaps even at all.

Another object I had in view was to furnish such of

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my young friends as are at a loss to know how to overcome the difficulties they frequently meet with in the various kinds of pruning, with a book of the necessary instructions, pointing out to them the proper methods in the case of all classes of shrubs and plants.

The method, the time, and all the requisite details, I may venture to say, are laid down under the various heads, and the work may be, I believe, relied upon as a safe guide for the young gardener, as well as for some of the old ones too, and also for the amateur lady and gentleman gardener.

It will be seen that I have adopted the "oblique double cordon," on what I think is a somewhat improved plan, which will accommodate itself to a class of wall more often to be met with than that which is attached to the great mansion. There are a number of dwelling houses, the small gardens of which are fenced with low walls—too low for training fruit-trees in the fan-shape fashion. The "oblique cordon," then, herein illustrated and especially treated of, is the thing for them. It will be seen that by adopting this useful and accommodating plan of growing Peaches, Nectarines, and Apricots much less judgment is needed in pruning—winter pruning—than is required in the fan-shape style; and it is no doubt more under control. Moreover, a larger amount of fruit can be obtained from a given space.

There are many old favourite Pear-trees of a choice kind trained on walls, which have done well, but now refuse to bear fruit, simply because all their fruit spurs are exhausted; and there they are, useless relics of their past goodness. Here, then, I offer the only conditions by which such trees can be restored to fruit-bearing, and finally become as useful as ever.

In conclusion, I venture to express a hope that the result of my present effort will be to raise the Art of Pruning to the high level of the other branches of horticulture and floriculture.

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THE FRUIT-TREE AND SHRUB PRUNER.

PART I.

THE PRUNING AND TRAINING OF FRUIT TREES.

CHAPTER I.

THE PEACH.

FIG. 1 is a maiden Peach-tree one year old. This rod may remain nearly entire except that a few inches may be taken off the top; and if the tree is planted on the wall in the month of November it may certainly remain as a nucleus for Figs. 2, 3, and 4. This manner of training has many advantages peculiar to itself: first, as much fruit may be had from low walls as from walls twice as high, as by training them obliquely much more wood can be commanded in order to produce fruit; and by this method of close cordon training a greater number of trees can be planted on the walls—instead of the trees being ten or fifteen feet apart, these cordon trees may be planted two feet asunder, by which means more fruit (and much finer too) may be had from the same space of wall.

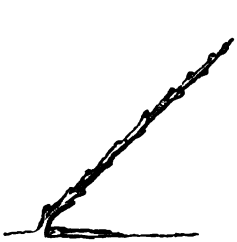

Fig. 1.

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Fig. 2 is the Peach with one year's laterals. When No. 1 begins to break bud some little care will probably be required in watching how the buds are likely to break. Some may be too weak and some too strong, and there will probably be too many. In such cases thin them out by disbudding, rubbing off those which are too bold, or else they will get the advantage of the weaker ones, and prevent them breaking at all, so that a defective tree will be the result.

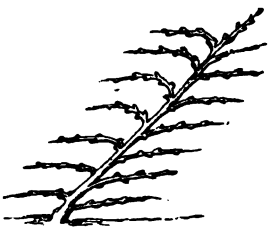

Fig. 2.

It is of the utmost importance to attend to the forming of a Peach-tree at the very outset; the foundation of the future tree must be well attended to in the maiden plant. Some very popular writers tell me that it will require seven years to produce a perfect Peach-tree. This to me is monstrous; and I think it will not appear at all unreasonable if I can show, by the method here adopted, that a full-developed Peach-tree can be fairly obtained within four successive years from the planting of the maiden tree, and this is applicable to both the old fan-shaped and the cordon tree.

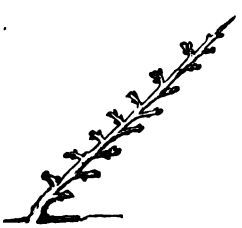

Fig. 3.

As soon as Fig. 1 has well broken bud and made three or four inches of young growth, stop each lateral; then there will succeed two other laterals, which will make equal progress, ripen, and no doubt will be well furnished with fruit buds by the following autumn. But as the young tree is not sufficiently established to bear fruit on all these laterals, cut one of them back to a bud as seen in Fig. 5, and shorten the remainder

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a little. Thus an oblique cordon Peach-tree capable of bearing some fruit may be obtained within three years; but unless the tree shows unmistakable signs of a good constitution, not more than one dozen of the fruit should be allowed to remain to ripen on each tree. As a rule, Peach-trees on good wall borders out of doors are generally too strong in growth for the few first seasons, and require some taming down, and I know of nothing better than allowing them to bear fruit early to do this. It is even better than lifting them to check rank growth.

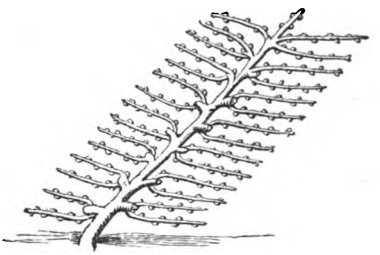

Fig. 4.

Generally Peach-trees will grow too strong if the land is strong and rich. In such cases it is quite a mistake to cut back young trees with a view to making them bear fruit; and there is no better class of tree to manage than the upright or oblique cordon: first, because of the control one has over it by way of lifting it, if not manageable by virtue of stopping, and so induce the tree to give fruitful laterals by laying them in thick; secondly, more trees can be planted on the same space of wall. This I have remarked upon before.

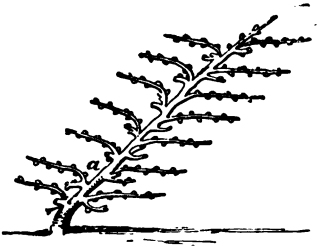

Fig. 5.

Now if Fig. 2 should be growing upon light and rather poor soil, the probability is that the first season's wood the maiden tree makes will be quite the reverse, and the buds will be weak and the laterals poor; if so,

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let them go unstopped, and then cut them back as seen in Fig. 3. The consequence of this will be two laterals the following season from each spur, as seen in Fig. 4. In order to maintain the perpetual character and constitution of the tree for many successive years, one of these two fruit-bearing laterals must be cut back every season, as shown in Fig. 5, and one to succeed it must be provided from the spur *a* all through the tree each succeeding year; and if the tree at this or any earlier stage should prove of too strong growth, and produce wood deficient in fruit buds, which may be easily seen by the end of the growing season, then dig round it carefully, and lift it, afterwards filling up as before; but, as I have observed already, when trees are too strong in growth, allow them to bear more fruit, and I can vouch for a more congenial and quiet growth as the consequence.

If the laterals in Fig. 2 are allowed to remain at nearly full length, as they may if of a good medium character, then every alternate bud giving a sublateral may be nipped in as soon as it has made three or four leaflets. This will have the effect of furnishing the first primary laterals with abundant fruit spurs, and thus a cordon tree will be formed which will be a complete bouquet of flowers, and capable of bearing any amount of fruit. This is a good way of possessing a command over a Peach-tree at pleasure, for if the tree gets too weak do not let it bear so much, and *vice versâ*. By either of these three methods of forming cordon Peach-trees it will be seen at once that a good permanent fruit-bearing plant can be obtained within four successive seasons from the planting of the maiden tree, Fig. 1.

Fig. 6 is an example of a fan-trained Peach-tree four years old from the planting of the maiden tree, which has been well pruned and trained each successive season. Now why some popular writers on the Peach require seven years to do this I am at a loss to understand. I am prepared to prove that this is three years' loss; not only so, but much valuable wall space is also lost by the miserably slow process of obtaining a well-

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developed fan-trained Peach-tree. The process of controlling the growth of these trees is different from that in the case of the "cordon tree," for it is rather inconvenient to lift an established four-year-old, well-developed fan-trained tree.

Now I think that just here I cannot do better than give my own experience relative to the management of such trees. I once had the care of a fine lot of Peach-trees in a most luxuriant condition—too much so, for they made too much wood, and little fruit could be got from them. They had been too freely thinned out, too severely pruned. "Well," thought I, "this will not do;" so, instead of pruning them so much, I laid in all the young wood that I possibly could, and the result was

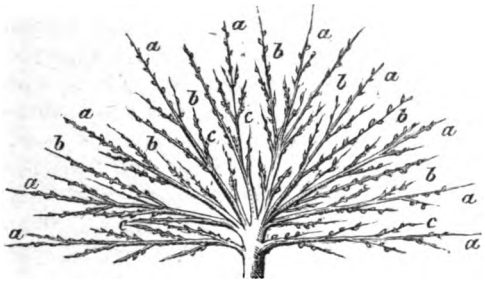

Fig. 6.

a complete taming down of the growth of them, and many dozens of fruit on each tree, which had to be discarded every season afterwards. There is no doubt that this is the proper management of over-luxuriant fan-trained Peach and Nectarine trees. I care not how luxuriant a tree may be, my object is to get it fully developed as soon as I can reasonably do so, and then I will control it according to its constitution, let that be strong or weak.

Fig. 7 is an example of a Peach-tree badly managed. Now, perhaps, some would not so regard it, from what I have witnessed of late, much to my regret; but no good practical hand will call it a good specimen of Peach culture. The chief fault among partially expe-

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rienced and novice Peach-tree managers is, that nine out of every ten of them do not actually study the constitution of each plant, but prune without knowing whether the tree should be severely treated, moderately done, or not pruned at all. They serve all alike, and generally speaking, among amateurs who keep a cheap gardener, Peach-trees go to ruin within three or four years for want of proper treatment.

Frequently, too, fan-trained Peach-trees get barren as regards fruit-bearing wood in the body of the tree, and only possess it towards the extremities, because the pruner is afraid to use the knife to keep the tree at

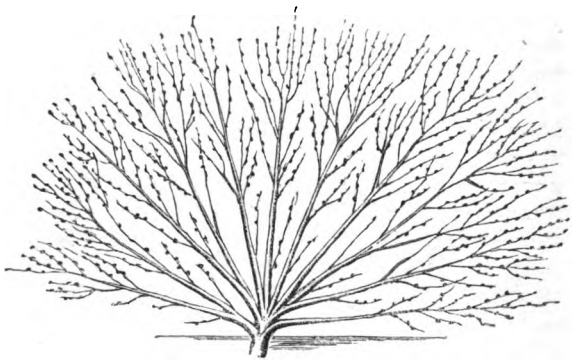

Fig. 7.

home; and in course of two or three seasons the tree is nearly past cure. But let me advise the young gardener by no means to be timid about using the pruning knife at the extremities of the tree. All trees, and especially trained wall Peach-trees, are prone to make more fruit-bearing wood towards the ends of the branches than towards the root or at the base of the branches.

Then young hands and inexperienced amateurs think it "a thousand pities" that young wood should be cut off; hence the tree rapidly deteriorates and arrives at the condition of Fig. 7. But if the principle of Fig. 6 is carefully followed up, the tree will never get out of

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order during the many years (twenty-five or thirty) of its existence, provided that contingent circumstances admit of so long an existence. These circumstances comprise certain precautions: first, in the due preparation of the border, which should be thoroughly drained, and elevated fully six inches above the ground level; and secondly, the border on which the trees are planted should never be dug with a spade, but with a short digging fork, nor should it be dug more than seven or eight inches deep. This depth will be quite enough, just as for early radishes, dwarf beans, or potatoes. An incalculable injury is done to the trees when the ground is dug deep with a spade. The roots are lacerated, bruised, and sometimes fearfully maimed. The consequence is that suckers are thrown up about the collar of the plant, the trees gum, and death ensues before they have come to what may be called maturity. The mischief is almost past remedy, but more of this in due time.

If Fig. 7 is not past age, and possesses only a few buds of young wood in the body of the tree, my advice is to cut it back at once without hesitation like Fig. 8,

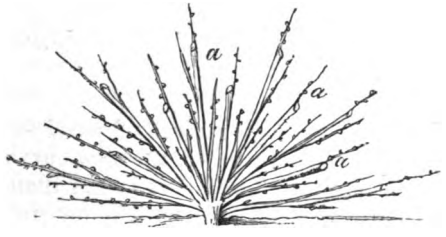

Fig. 8.

when a new tree will be obtained like Fig. 9. It is possible that a strongly constituted tree will make very vigorous growth the first season after cutting-in so severely. In such a case lay in all the young summer growth possible, as well as in the winter also, till the tree gets tamed down a bit. When it possesses a good stock of fruit-bearing wood treat it as you would Fig. 6.

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In pruning Peach and Nectarine and other wall trees be careful to have a fine, thin, keen-edged pruning knife. I mention this because I find young hands who have not been well trained frequently use knives too large, too much of a hook shape, and not possessing a thin blade, nor sufficiently keen-edged to make good clean work in this kind of pruning. The consequence is, that the cuts being often left with a fractured edge, they frequently split, and the result of all this has a fatal effect upon the tree.

In cutting a tree back like Fig. 7 saw the thick branches off carefully with a fine-toothed pruning saw,

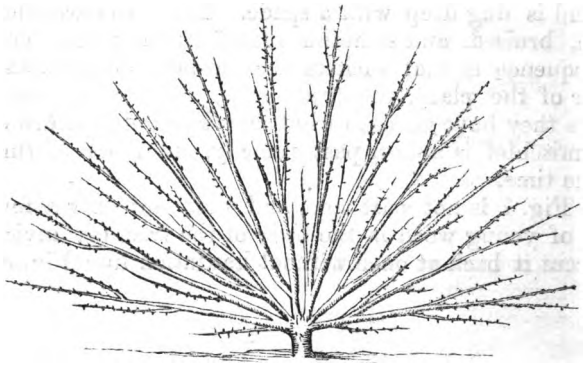

Fig. 9.

close to the base of a young piece of wood (see Fig. 8, letter *a*. Then smooth over the saw-cut with the pruning knife, and if the limb is larger than one inch in diameter paint the cut over with some grafting-wax made of pitch, mutton fat, and bees'-wax—1 lb. of the pitch, 2 ozs. of the fat, and 2 ozs. of the wax melted together in a pipkin over a slow fire. Put this on when it is just warm enough to spread with a brush; this will keep any water from getting into the heart of the branch, and will prevent decay.

Now, without going into modern and comparatively unknown technicalities, which are of little or no use to a learner, I beg to observe that when a Peach-tree, or in-

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deed any fruit tree, makes wood of a fruitless character, do not cut it much, but lay in more wood during the summer growth, and I can vouch for success in bringing any tree into a good fruit-bearing state.

Some think that if a Peach-tree gets into the subsoil it will not bear fruit. I confess that if the subsoil is of a cold retentive clay, and lying upon a flat, the chances are much against it, and also against the well-being of the trees themselves. But who would plant trees of this sort on such soils without first draining them, and otherwise preparing them for Peach-growing? No one. Then I contend that no one need fear on account of fruitless Peaches getting into a good, well-drained subsoil.

Training Peaches on Walls.

In the case of the "*cordon* Peach-tree" a certain amount of constant training is a principle that cannot be departed from, especially if summer pruning is literally carried out; for then not only the main leader will be a permanent thing as long as the tree exists, but the laterals will be of the same character also. But in the case of the fan-trained tree permanency will soon prove ruinous, because they, like all others, run to the extremities, and even more so. Moreover, they cannot be controlled so easily without cutting back, unnailing, and replacing the wood extracted from the tree every season. It is this permanency in fan-trained trees that ruins the Peach-trees on walls.

In pruning a fan-trained Peach, let the novice be careful to attend to the unnailing, cutting back the most prominent leaders of the tree, and maintaining the character of Fig. 6 and Fig. 9, whether the tree is young, medium, or old, and also to train his trees accordingly. The first thing to do, when a tree is to be trained uniformly (and it may as well be done so as in an indifferent manner or irregularly, like Fig. 7, and they are sometimes much worse), is to lay out each of the primary leaders, *a a a a a a*, Fig. 6, dividing them equally and quite straight, and making them

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fast by strong nails and shreds, always taking care that the nails are on the pulling side of the branch. Be careful not to let the nail come in contact with the wood, and never strike the tree with the hammer, for each of these things will cause gum. The next thing to do is to equally divide the second leaders, *b b b b b b;* then the laterals, *c c c c c c;* always observing the same rules respecting the direction of the branches, division, and position of the nails.

In my opinion the winter pruning of the Peach is best deferred until February or March, not because you can see better what to cut out and what to leave in, but because the trees are better able to resist the severe vicissitudes of such a fickle climate as ours; nor are the wounds then exposed to the drying and often protracted frosts, which will have the effect of producing crippled shoots in the following spring, besides, in some cases, causing dead limbs.

Each tree, as soon as it is pruned, should be nailed or trained in without delay; and as at this time of the season the fruit buds will be very prominent, great care is needed to avoid rubbing them off. If the walls are of brick—which are the best—no doubt wires to train them on may be good, because then the heat given off by the bricks will be enough, and will be more equalised than it is when the fruit is close to them, which often has the effect of scorching it. But if the walls are of stone, in certain seasons some difficulty may be felt as regards the ripening of the fruit on wires. The fruit will always be later on stone than on brick walls.

Summer Pruning and Training.

This consists in disbudding useless wood buds, *i.e.* all foreright buds, and some lateral ones not likely to be required. All buds that appear in front of the branches, so that they will not conveniently lay in either on one side or the other, must be rubbed off, and as soon as the young growth is long enough to nail in, it should be done, and all crippled leaves removed from the

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trees. As I have already observed, now is the time to control the tree, according to its constitution. If the tree is weak, disbud more freely; if the tree is too luxuriant, lay in more wood.

Now is the time also to make rosy and handsome fruit or pale fruit. If the fruit is exposed to the sun from the first, *i.e.* from the time it is of the size of a small walnut, through the whole growing season until it is ripe, handsome and fine-flavoured Peaches will be the result; but if it is shaded by the foliage of the tree it will be as fine, but it will be of a pale colour. If shaded by the leaves till half grown or nearly full grown, and then exposed to the sun, the Peaches and Nectarines will get scorched on the side exposed, and be spoilt in appearance.

The fruit must be thinned, allowing three or four to remain to a square foot, according to the strength of the tree. It should be thinned as soon as it gets to the size of a filbert; and if the ground of the border on which the peaches are growing is of a stony and free nature, and the drainage of a very loose kind, I advise that one or two thorough good soakings with liquid manure be given them as soon as the fruit has attained to the size of a walnut, especially if the ground is poor and the trees are weak. It will be necessary to go over the trees twice at the least during the summer, to regulate the growth, and to nail in neatly all the good young wood.

In most young Peach and Nectarine trees, and others that are cut back, some very gross shoots will be made with wood buds a long distance from each other. These rank-growing shoots can be observed before they are half developed. As soon as they are from six to nine inches long, stop them by nipping off the top. The consequence will be a shoot of a weaker nature, produced from each bud below; and should these lateral shoots indicate too rank a growth, when they have made six inches of growth stop each of them again; by this means moderate fruit-bearing wood will result. Now, I think I have said (as briefly, and yet as much

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in detail as is necessary) all that is really requisite on the management of the Peach on walls out of doors. They should, however, be frequently syringed during the development of the buds before the flower expands; but never syringe them while in full flower. It is a good plan in fruit-growing to preserve the pollen of the flower as dry as possible. To do this, hexagon fine cotton netting or coarse gauze let down over the trees at night is a good preventive against the night damps during its development; but these screens should be removed by nine o'clock in the morning at the least, on sunny days. The syringing may be carried on frequently after the fruit is set, and it should be done early in the morning during the months of *May* and *June*, before the sun rises upon the trees. I prefer the morning for syringing at this period, because, if done in the evening, the chilly cold nights give an additional check to the sap; and I have no doubt but that this is the cause of the crippled state mostly attendant upon the young growth of wall Peach-trees in the spring. The crippled state of the buds must certainly arise from the effects of the cold nights. This suggests a balancing of the day and night air by some means; and I know of nothing better adapted to this than the hexagon netting referred to, fixed upon poles let into the ground, and fastened

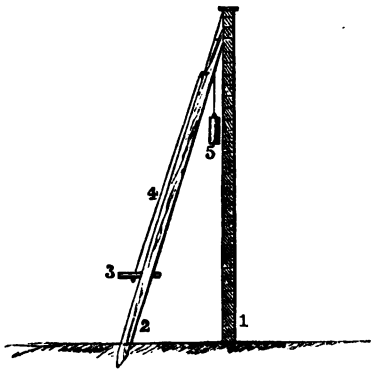

Fig. 10.

REFERENCES.—1, the wall; 2, the poles; 3, the pegs driven through the poles; 4, the cords on which the netting is fastened; 5, a weight of lead fixed on the cords by which the netting is easily pulled up by merely lifting the nets off the pegs; this weight should be a balance, and will retain the nets in position without further trouble.

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at the top of the wall, placed six feet asunder, the netting being let down and pulled up by means of cords running through a hole made in the small pole at the top, and having pegs driven into each pole at the lower part, two feet from the ground. These are to rest the netting on when it is let down in the morning, and to keep it firm in the ground. These pegs will also answer for fastening the cords when the netting is drawn up. The sketch above will explain my meaning.

I contrived this when I was in charge of Peaches for a gentleman, and I found it answer well. A boy, or even a girl, can attend to this work night and morning during the few weeks the netting is required, which will be no longer than till the fruit is set, when the whole thing may be removed. The nets should be thoroughly dried and done up, being placed in a box or open bag, and put away in some dry room for another season; and with care these nets will last for many years. If even gauze is used it will prevent the pollen of the flower from becoming injured by the cold, damp night air.

Now I think I may close my remarks upon the pruning of Peaches on walls out of doors. I do not think I have omitted anything really useful except as regards destructive insects, diseases, &c., which I shall specially confine to a subsequent chapter. I do not think it worth while to multiply words, or to go into useless technicalities of detail, which may have a tendency to puzzle rather than to instruct.

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CHAPTER II.

THE PRUNING, RENOVATION, AND TRAINING OF THE PLUM.

It is useless to attempt to grow good Plums in a cold, water-holding, clay subsoil. The soil should be gravelly, or one having a subsoil of a very porous texture, and dry, with an abundance of sand in it. The Plum will bear frequent removals, and this is a good way of treating a strong-growing young tree, whether it is a trained tree or not.

In some parts of the country the Plum, like the Apricot, will not kindly bear fruit. The soil is not always at fault in this matter, for the climate does not perhaps suit it. It is a rare thing to get Apricots in the county of Devon, and as seldom can a crop of some of our choice Plums be had there. The reason is chiefly attributable to the pollen of the flower getting glued by the dampness of the locality; the consequence is that the fructification is imperfect. The stigma does not get fertilised by the pollen from the anthers, simply because it is glued by the prevailing damp, and so cannot disperse. As a consequence the fruit cannot stone, hence a failure of the crop. In such cases there is no remedy for Plums planted as standards or dwarfs in the open ground, away from dry, warm walls, except one, and that is to grow them in pots upon Mr. Rivers's plan. When the climate suits them, and still they will not bear freely, but make wood, lift them every other season in the month of October. Merely dig round the tree and cut off the lacerated roots, and then plant

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it again carefully, using no dung; a poor soil suits Plums far better than a rich one. The same thing applies to wall Plums when not disposed to bear; and for this reason I recommend "the cordon training" as a very useful type for lifting, as well as for the control obtained by it over the tree.

Fig. 11 is a *Magnum Bonum* or Orleans Plum, four years old, fan-trained on a south wall, and nipped back during the summer, *a a a a a a a a; b b b b*, the succeeding leaders to fill up and to remain permanent. If this class of tree is obstinate and grows too rampant, as they mostly do on strong soils, lift it,

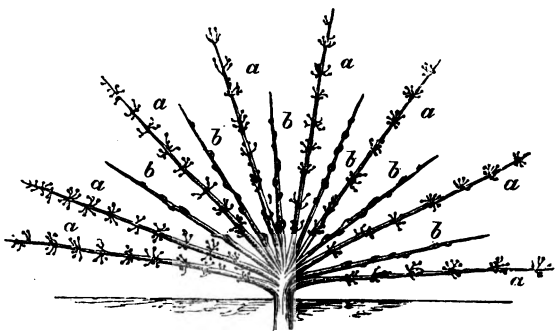

Fig. 11.

as for standards, every alternate season until it is productive. There is no better remedy to bring an over-free growing tree into a fruiting state.

In planting the Plum take care not to plant it deep, but as shallow as possible, so long as the roots are covered with six inches of soil. And do not cut it back if a trained tree, but lay the wood in at full length, unless it is intended for a treble cordon, like Fig. 12. But if the single cordon is required, like Fig. 13, I advise the planting of a strong one-year maiden, and to lay the single rod in at full length at once. If for a double or treble cordon, as Fig. 12, it will no doubt be

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necessary to cut the plant back the first year to get a good equal growth like Fig. 12. These cordons may take

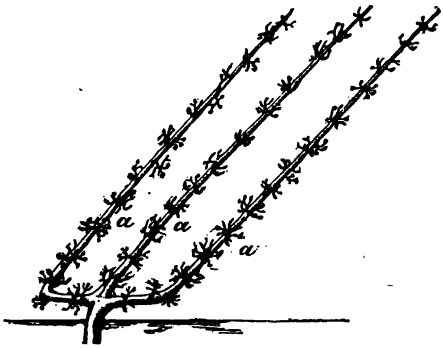

Fig. 12.

two or more years to form to the required length; nor is it the best plan to induce them to grow too fast with

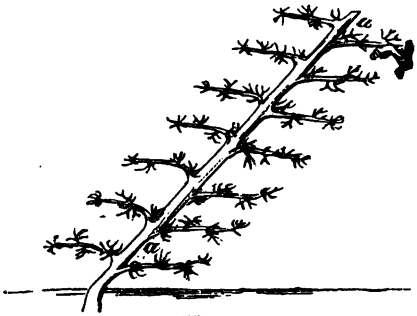

Fig. 13.

a view to get a full tree, for then the buds will be too far asunder.

In the case of Fig. 12 the fruit spurs are formed on the cordon leaders by summer nipping, as soon as two

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leaflets are made, the tree being lifted every season in October to bring it to a fruit-bearing state, if not otherwise so inclined. As soon as an abundance of short fruit spurs are formed, as in *a a a*, let the tree remain till it shows signs of vigorous growth, which the Plum will do in strong soils after a few seasons; then give it another check by lifting.

In the case of Fig. 13 the fruit spurs are situated on the laterals, which may be equally good, as these laterals may be extended to a considerable length so long as the fruit spurs can be sustained in good order nearest the cordon leader, *a a*. Perhaps three feet on each side are as much as they should extend from the body of the tree, as the growth will always run to the ends, and so rob the spurs near the leader, but this must be overruled by lifting and replanting.

Plum-trees are a mere name in most gardens, and will remain so, as long as they are allowed to grow as they choose through the summer, and then merely having cut off in the winter what they have made in growth during the summer. The lifting, replanting, and the nipping in during the summer are the only means by which the Plum can be made to bear freely every year. The Plum is an early flowerer, especially in such counties as Devon and Cornwall, which are of an unusually mild climate, and abounding with moisture in the air, from their proximity to the sea-coast on three sides.

The Plum, Apricot, and some Pears, generally get too forward as regards the flower, and thereby get cut off by the late spring cold winds, so that not one season in five do we get anything like a crop of some kinds of early Pears (I mean some early-flowering Pears), nor a crop of Plums; and in the case of Greengages seldom or never. To remedy this, something more than the ordinary way of growing Plums, such as is adopted in those counties, must be resorted to; and for this nothing can be better than Mr. Rivers's "Hedge Orchard-house," which, for the convenience of my readers, I may venture to describe, with some little

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modification. A span roof of any desired length, but not above 15 feet wide, may be built with a fixed roof, *i.e.* the glass placed in the rafters, which should be 20 inches asunder, and glazed with sheet glass 20 by 12. This gives frequent laps, which are essential for ventilation, as the laps will not be perfectly air-tight, nor is it required for this class of fruit-growing. The squares are laid in crossways, *i.e.* the narrow way of the squares counts up the rafter. The rafters need not be more than $3\frac{1}{2}$ by $1\frac{1}{2}$ inches, and should have a rap nailed on them to form the rebate instead of forming it in the rafter. The roof must be supported on larch fir posts, which must be let well into the ground—18 or 24 inches will be sufficient—and stand out of the ground enough to admit of a short man walking round the house inside when a sunken pathway has been dug out a foot or 18 inches deep. This pathway must not be dug out nearer than 18 inches from the posts inside, or they will give way, and an 18-inch pathway will be enough to walk in. It may be necessary to put a row of small drain-pipes 6 inches under the pathway to carry off any superfluous water that may drain in.

The sides of this Plum-tree orchard-house may be planted thickly with "common Yew," or *Siberian Arbor-vitæ*, and clipped twice during the growing season, but not too late the last time. A flap-board shutter must be made at the top ridge for ventilation, which may be made to open and shut with cords. This shutter will not require opening before the trees are in flower, nor shutting after the fruit is set, and the hedges will admit an abundance of air without any trouble—a thing of the utmost importance with the Plum.

The house should run east and west, and the trees planted and trained north and south—*i.e.* running across the house—4 feet apart, and trained as single "cordon oblique," then the sun will get at both sides of the trees. They may be trained on coarse wire netting strained on permanent iron stakes, and planted 18 inches asunder for single cordons, and should be con-

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stantly nipped in. Thus an abundance of Greengage Plums may be had of the finest quality. The winter pruning consists in merely going over the trees with a keen-edged trimming knife, and neatly cutting the wood shoots close down to one bud, so as to keep a compact spur as nearly as possible.

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CHAPTER III.

THE PRUNING, RENOVATION, AND TRAINING OF THE PEAR.

THE Pear has engaged the attention of all fruit-growers and writers on these subjects as much as the Peach, and perhaps even more, from first to last. Yet even now we can go into gardens and find Pear-trees of all classes sadly deficient as regards good culture. It may seem strange to some, but it is not difficult to

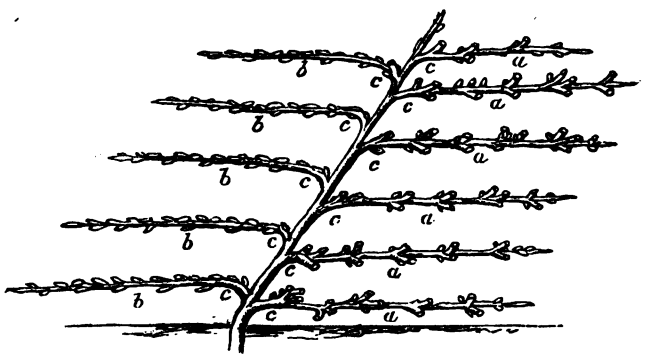

Fig. 14.

find gardens where the Pear is in exactly the same deteriorated state as it appears in the illustration, Fig. 15. This is too bad at this advanced stage of fruit culture.

When pyramidal or wall-trained Pears are to be

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planted, choice should be made of those worked on the Quince stock, for then the growth is more congenial to early fruiting, and much less rampant. In the case of dwarf pyramids as well as trained trees, it will be necessary to lift them every two or three years to check too strong a growth, which is sure to arise in the

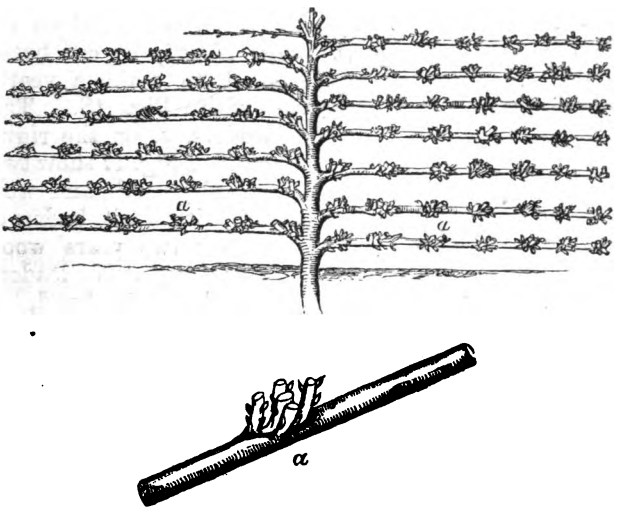

Fig. 15.

course of a few years with the Pear in good strong ground. Yet this is what is wanted to get fine fruit.

Fig. 14 is an example of a too free-growing comparatively young tree which has been annually cut back on the spur system, *a a a a a*. When a tree gets into this wood-making state little or no fruit will be had from it, except at the extremities of the leader on the two-year-old wood. In such a case the best plan is to cut the old spurs close off to the leader, as in *b b b b b*. Do this in the autumn after the tree has been

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lifted or root-pruned, and the following season a weaker growth will be made, which, if frequently stopped during the summer, will produce fruit buds. If the tree is too large to lift, dig all the soil away from the roots to find the strong feeders, and sever them with a long sharp chisel, leaving the weaker roots untouched; or all the laterals, *a a* and *b b*, may be cut off at *c*, and let one year's growth be made before lifting or root-pruning, and then do it, which will produce an abundance of fruit spurs. Fig. 15 may be cut back, as seen in Fig. 16, and allowed to make a year's growth, which will compare with Fig. 18. The leaders, *a*, on the right hand of Fig. 17 show two years' growth, and well set with fruit buds, *b*, on the two years' wood all through. The leaders on the left hand, *c*, show the proportion of growth made the first season, and this is the proper time either to lift the plant, if not too large, or to root-prune it, *i.e.* as soon as the wood has done growing for the season, which is about the end of September. A worn-out tree may be reclaimed by this method if it is healthy, by which I mean a Pear-tree which has become past bearing, or that gives nothing but wood. These are still frequently to be found in good gardens as well as in ordinary ones, and many devices are suggested for their recovery. Some resort to ringing to bring them into bearing, but this is of little use. It is possible to give a sudden check to the growth of a tree by this ringing method, but it is sure ultimately to end in its death. But by

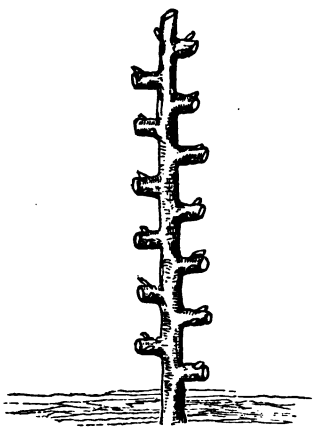

Fig. 16.

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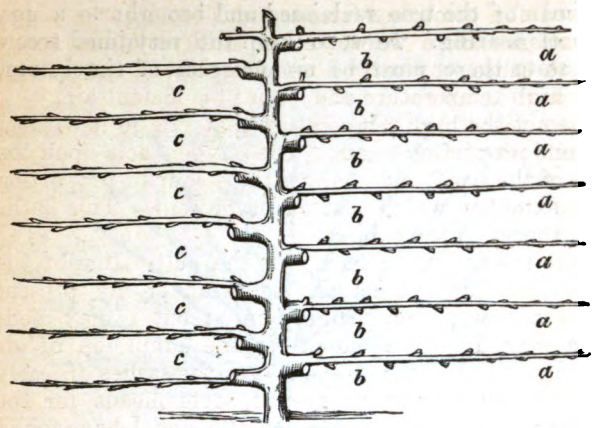

Fig. 17.

doing as I have directed above, a Pear-tree may be reclaimed, renovated, and made to bear well.

As soon as the cut-back tree, Fig. 18, has made one year's growth, as in Fig. 19, lift it, and then it will pass into the state of Fig. 20, when it should be lifted every alternate year, and the spurs nipped in all through the summer, when an abundance of fruit spurs

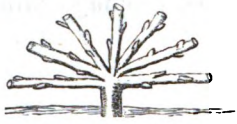

Fig. 18.

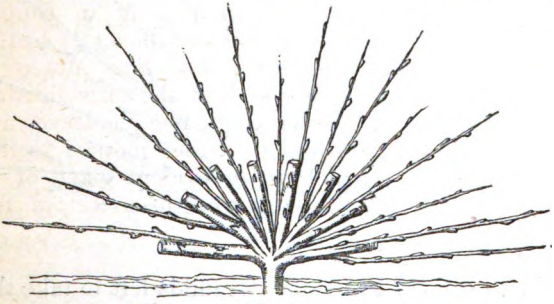

Fig. 19.

will be found, as in Fig. 21, which example is a fair

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specimen of the tree reclaimed and brought to a good state of bearing. Now, to keep the reclaimed tree in this state there must be no omission of timely root-

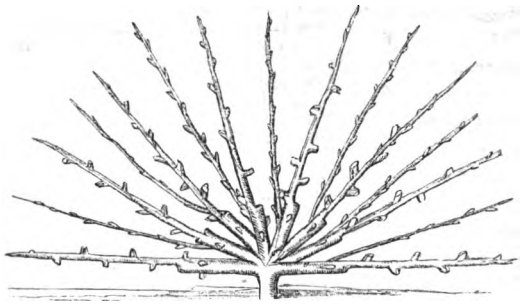

Fig. 20.

pruning or lifting, for it is a fact that Pear-trees are more liable to get out of a fruit-bearing state for want of root-pruning or lifting than any other class of tree

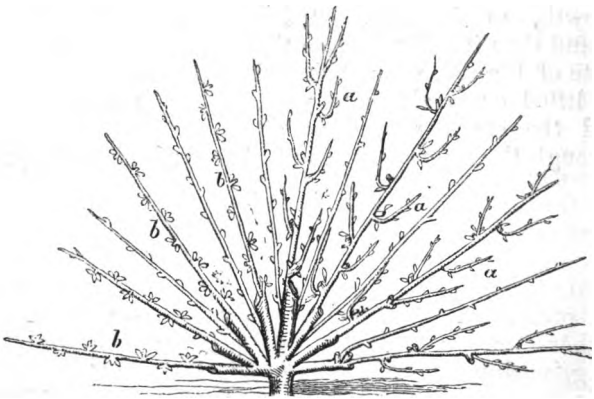

Fig. 21.

(I refer to trained Pears and pyramids left to take their chance, and not to standards), especially when grafted on the Pear stock. The reason is, that the Pear has a

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natural tendency to descend deep into the ground, and to feed freely upon the moisture below; and, as a matter of course, there is always more of this below than nearer the surface of the ground, *i.e.* the deeper we go, the more moisture abounds. The Pear is fond of this, and will descend for it, and if the soil is naturally good below, and abounding in moisture, it will grow too rampant after a little while from the first planting; this is why the Pear gets unfruitful in the form of trained trees sooner than any other class of fruit tree. On the right hand of Fig. 21 may be seen the annual growth of a reclaimed Pear that has been well root-pruned or lifted, *a a a*, laterals from the spur, which, if nipped back three or four times during the summer, will not require cutting back as seen on the left hand of the tree, *b b*, and will, moreover, produce an abundance of fruit spurs, *ccc*, Fig. 22. But if not nipped back during the summer growth something like the Fig. 23 spur will be produced, *i.e.* if the tree has been root-pruned or lifted, but if not these spurs will become fruitless, like Fig. 15, letter *a*. In this case there are no fruit buds. These are easily distinguished the one from the other. The wood buds are more pointed than the fruit buds, and less prominent.

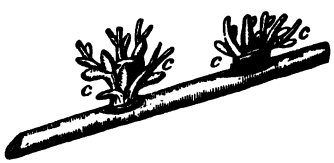

Fig. 22.

It is of no use to allow a Pear-tree, above all others, to grow all the summer, and then to prune all the young stuff off, and so continue to do from year to year. The fact is, the wood buds draw so heavily upon any promising fruit buds that they cannot form where they other-

Fig. 23.

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wise would. To prove this theory correct use the very same tree differently, and follow up the plan of summer stopping, and then it will be seen that there will be more fruit buds than are wanted to produce a good crop of fruit. Some will say, But you cannot change the nature of each class of bud. I admit that a fruit bud will remain so for the time; nor can a wood bud be changed immediately from its own special character to one of another; but at the same time the wood spur can be made to produce fruit buds in the following season by the simple treatment referred to above, while a fruit bud, or rather a spur, will completely change from its character to a wood-bearing spur only in one or two seasons, merely by allowing a Pear to grow on through the season, and then to prune it off during the winter time only.

When a young Pear for a trained or pyramidal tree is planted lift the tree every alternate season for some years. This will induce the tendency to form a matty fibrous root, which will produce a corresponding state in the branches.

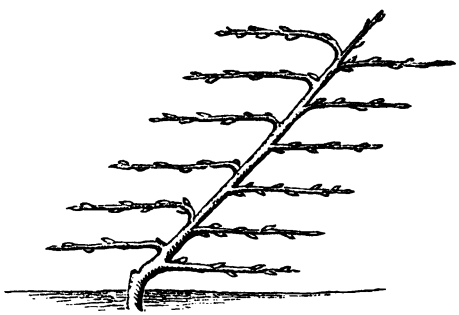

Fig. 24.

Fig. 24 is an example of a young cordon-trained Pear; Fig. 25 of the treble cordon Pear checked and summer-stopped, forming a well-favoured fruit-bearing tree. Of course cordon Pears may be multiplied in this way to almost any extent, and trained in a

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variety of whimsical methods; but I advise that plan of training which is most convenient for lifting, especially

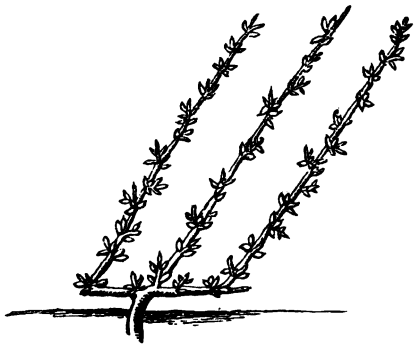

Fig. 25.

in Pear-growing. Considering this as a primary principle in Pear culture, none is, in my opinion, more eligible than the single, double, or treble cordon.

Fig. 26 is the maiden Pear for a pyramidal tree. When a plant of this sort is chosen select one with short joints, or spaces from bud to bud, for on this depends the formation of a compact or thin specimen. A plant that has grown very strong the first season from the graft will invariably possess fewer buds in a given length of wood than one of a moderate growth. The stronger and more vigorous a tree grows the first season for a standard the better, but not so for a cordon or pyramid; for this reason I observe the necessity of cultivating these two classes somewhat differently. Very rich and deep land may be selected for the stocks of the standard class, but land of a medium strength is best for cultivating the Pear for sale for the trained and pyramidal class. The first object should be the formation of a

Fig. 26.

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close-jointed tree for the latter, and when the foundation is well laid better ground may be allowed for them.

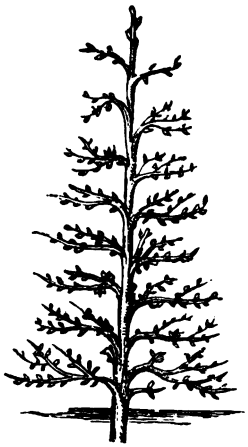

Fig. 27.

Fig. 27 is the maiden, Fig. 26, two years old, or rather two years planted, three years old from the graft. This is an example of a tree well formed, and that has been lifted and thumb-and-finger pruned through the summer.

Fig. 28 is an example of the same tree not thumb-and-finger pruned, showing a deficiency in fruit buds. Little can be looked for from Pear-trees of this class but wood if they are not lifted every alternate season, and well followed up by thumb-and-finger pruning. In case of neglect of this duty no alternative remains but to root-prune the plant in the autumn, and to prune it during February or March, or even April. I choose the spring annual pruning as preferable to the autumn for this class under such circumstances, because it will rather reduce the tendency to make wood than otherwise, which is a necessary thing when a Pear is winter pruned. The last season's growth should be cut off to within one wood bud, and

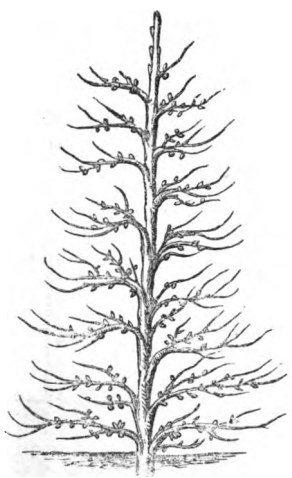

Fig 28.

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the cut should be a short one, as shown in the illustration, Fig. 29—*a*, the wood bud; *b*, the fruit buds; *c*, the style of "short" cut—and as often as winter

Fig. 29.

pruning is done to either this class of tree or trained trees of any sort, whether Pear or Apple, it should be effected in the same manner, *i.e.* cut as neat and as close as possible to the last wood bud; in fact, all the young wood may be cut off as close to the fruit buds as possible irrespective of a wood bud at all, for Pears are sure to make wood enough at all times.

These pyramidal Pears can never be kept within the desired bounds, nor be made handsome and fruitful, unless they are judiciously managed; and I look upon them as miserable disorderly things when done badly; and certainly they are infinitely more inconvenient and cumbersome than standard trees, for you cannot do anything with the ground near them. Moreover, nothing can be grown under them; while, on the other hand, if they are well managed they make most handsome and prolific trees without taking up much room.

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CHAPTER IV.

THE CHARACTER AND TRAINING OF THE APPLE.

THE Pear is a very delicious fruit, but the Apple possesses some advantages over it. Whilst the Pear is prized for its richness, the Apple is held in high esteem for its accommodating properties to various purposes, times, and seasons. There are what may be called three classes of Apples, and each of these possesses some peculiar virtue of its own. First, there is the real sauce or jelly Apple, a most useful class; secondly, there is the dessert or eating Apple; and lastly, there is the cider Apple. This last is often substituted for the first, but there is a considerable difference in the quality of these two classes.

It will be found on trial that the real cider Apple possesses more juice than the real garden sauce Apple, but it contains considerably less sugar than the sauce Apple, or at least there is more insipid juice. I discovered the difference immediately when I first tasted a tart or pudding made with the Devonshire cider Apple. Our very best garden sauce Apples will not make cider, because they do not contain fluid or juice enough, and the juice is not much in advance of dirty water when first pressed out of the fruit either as regards appearance or flavour; and though our best garden sauce Apple possesses juice enough for tarts, jams, &c., it has not enough for cider-making.

Next comes the dessert or eating Apple, and this class is superior in flavour to either of the others. It may be cooked, but it will not answer for sauce or jams, nor

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for cider. The *Ribstone Pippin* may be taken as a type *par excellence* of this class. It will not cook well, but it possesses all the qualities of a really good eating Apple. The *Keswick Codlin* and the *Hawthenden* may be taken as types of our sauce or cooking Apples. And what is called the *Bitter Sweet* may also be taken as a fair specimen of the cider class, which, however, no one would care to eat under any circumstances, such a tasteless variety is this Apple; yet it is prized for cider-making.

Having referred a little to the various classes of this highly favoured fruit, I may now turn to its cultivation.

The Apple differs considerably in disposition from that of the Pear, good deep land being required for the former. If the Apple is grown on poor dry land the fruit will ultimately be small, and the trees will become dwarfed and cankered, and will probably be covered with some kinds of lichen. This will depend greatly upon the locality—at any rate the fruit will be small. The Apple should be grown on rich sandy loam containing considerable moisture—a subsoil naturally retentive of moisture, but not to saturation or super-saturation, anyhow for a long time. The cider orchards of Devonshire are mostly planted in low grounds, and often where water abounds to saturation, but then there is a free drainage for excess of moisture, and here the Apple flourishes exceedingly as cider fruit.

The Apple differs somewhat again from the Pear in regard to another feature of its disposition. The latter must be root-pruned or lifted to induce fruitfulness, but this is not required for the Apple, at least as a rule. The Pear is naturally disposed to go too deep into the subsoil; the Apple has a tendency to run on or just below the surface. Of course it will ultimately make some deep ramifications into the soil below; but generally the small roots are not deep, nor is there the same tendency in that direction that there is in the Pear stock, so that as a rule Apples do not require root-pruning nor lifting to make them bear. I think the

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Cornish Gillyflower may be almost taken as an exception. I find by experience that this Apple has a tendency to make wood very freely with long flexible shoots annually. I am of opinion that these might be checked by root-pruning, and then the plant would be more fruitful than it is at present; but it is a very tender variety, seldom perfecting the fruit out of Cornwall, or farther north than the south border of Devonshire. I have had this variety in my care for many years, but never get one tithe of a crop. It is a most delicious fruit.

In my opinion great mistakes are made in Apple culture. The choice of dwarf trees worked on the crab stock is an error, for unless these are annually cut back close, they soon get cumbersome and quite ugly, possessing a large head with a short stem. Again, standard Apples should possess clean straight stems not less than six feet high up to the first branches from the ground, and when it is intended to cultivate espaliers (which I think are certainly the most convenient for an economical and neat garden) the choice should be made accordingly, with no deviation therefrom, as is the case sometimes.

If pyramids are preferred, then choice of sort and plant should be determined upon beforehand, and no change made thereafter, as I find is sometimes the case. Here we have three classes of tree, each of which possesses a different character, and which should ever be maintained after in its purity of form. Each and all of these are commendable as such, in their respective places, but I have seen a whole garden of trees actually presenting a most unsightly appearance (and the garden itself too) entirely because the person who planted them did not predetermine what class of trees he would cultivate. It seems to me that no change of character can be well made after the plantation is complete, say after a few years.

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The Pruning of the Apple, and the Renovation of the Apple-tree.

Fig. 30 is an example of an old dwarf standard left to grow unpruned. This is exactly what I mean as the effect of not predetermining what class of tree to cultivate before the plantation was made, and the neglect of annual pruning. Fig. 31 is an example of the same class of tree properly managed by annual pruning.

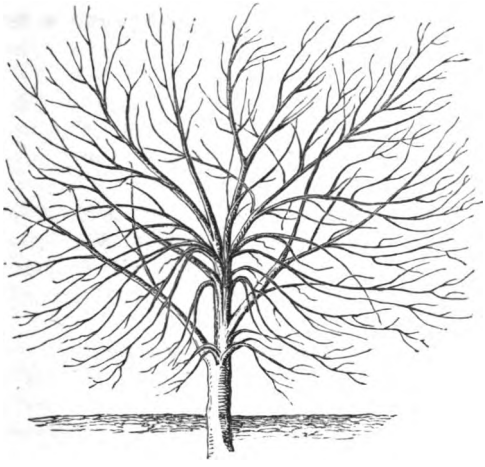

Fig. 30.

I once found a lot of young trees of this sort in a garden of which I had the care, and they were getting into the same state as Fig. 30. Well, I at once commenced cutting all the last year's growth off close to the old wood, as is shown in Fig. 31, and continued to do so every autumn or winter afterwards, and of course the trees increased in size, but very little—an important thing in all gardens, especially small ones. Yet as much fruit could be grown from such closely pruned trees as would be had from them if left un-

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pruned, for my trees thus pruned produced fruit like ropes of onions, and it was considerably finer than it would have been if the trees had not been so closely attended to. The trees present a very neat and compact appearance, do not shade the ground, and room is left for more variety or a greater number of trees.

If summer pruning is well followed up, an abundance of fruit spurs in clusters will be formed. If winter pruning only is adopted, cut as close to the base of the last season's growth as possible, using a large keen-edged pruning knife, and make the cuts short across the wood. It may be necessary to root-prune a few sorts,

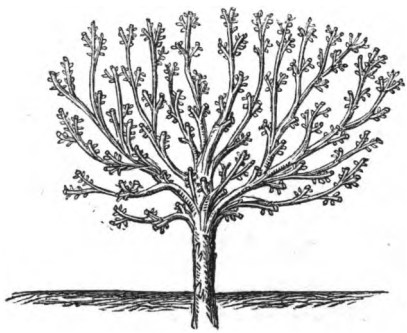

Fig. 31.

as I have already said, if they are grafted on the crab, but trees for this purpose should be chosen that are worked upon the Apple stock. In the first instance, when a young tree is planted, look well to the symmetrical formation of the plant. Set out the first principals of the head of the tree. If a maiden plant is used, decapitate the tree at the proper height for a half-standard or standard, and set out the branches as equidistant as may be possible. Then fill up between them with second principals, and ultimately the diverging laterals; and when the head is formed similar to Fig. 31, maintain its character as long as the tree will bear, which will be many years; but when the tree

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ceases to bear (which ultimately it will do, in the course of thirty or forty, or perhaps fifty years, according to circumstances—sort, soil, locality, &c.) a process of

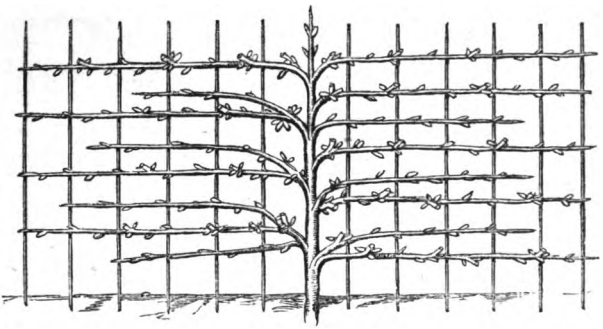

Fig. 32.

renovation may be recommenced. This consists in cutting back and grafting, or restoring the tree by a new set of branches. Now, if the tree is free from decay in the roots and stems, it may be restored by

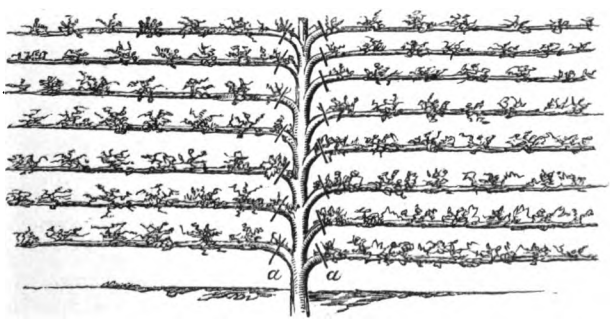

Fig. 33.

either process, but if the stem is decayed, or inclined to do so, it cannot be renovated, but must be rooted up, and a young one planted in its place.

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Espaliers and pyramids may be renovated by cutting back, if all is sound about the root and stem, and the land is of a good friable loam or gravelly; but if it is of a stiff cold clay below, renovation by cutting back a very old worn-out tree is but a poor speculation. Grafting must be resorted to in such cases.

Fig. 32 is an example of a well-devised young espalier Apple.

Fig. 33 is an example of the espalier past fruit-bearing. In this case cut the laterals off at *a*, and graft them, or allow the tree to make fresh growth, judging whether it will do so or not from its healthy appearance or otherwise.

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CHAPTER V.

THE CHARACTER AND CONSTITUTION OF THE CHERRY.

THERE are only a few localities which suit the Cherry. A dry soil and a dry air are the necessary requisites for success in the cultivation of it. In such counties as Devonshire and Cornwall a crop of this fruit is a rarity. In those warm humid climates the Cherry will make flower buds freely, but in consequence of the early opening of the flower and the humidity of the air, combined with frequent cold seasons and sudden changes of the weather, in nine times out of ten a complete failure ensues with the best kinds; and even should the weather prove moderately favourable the dampness of the air prevents the pollen getting distributed, and so no fertilisation can take place; hence the fruit drops off before it comes to maturity.

The Cherry, as a rule, is not fond of the knife, and, therefore, summer stopping for trained and bush trees is most commendable as a preventive against gumming, to which this tree is much liable. It must be carefully handled in pruning, planting, and in its subsequent cultivation. As a rule it will not require much thinning of the branches, although sometimes a standard will require a little thinning out, as shown in Fig. 34, but this is seldom the case. When done, it should be carefully cut back to a young piece of wood, leaving the young wood of a standard unstopped.

Fig. 35 shows a fair example of a pyramid pinched-in Cherry, which forms a remarkably pretty object; and a very convenient class of tree it is too, for these

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compact pyramids may be planted on warm dry borders round the garden, and if nipped in close, and kept so for years, they will make but little advance in size. They will, however, bear an abundance of fruit, which can be easily kept from the birds by coarse gauze or fine netting, and so insure the fruit, which can never be done in the case of standards.

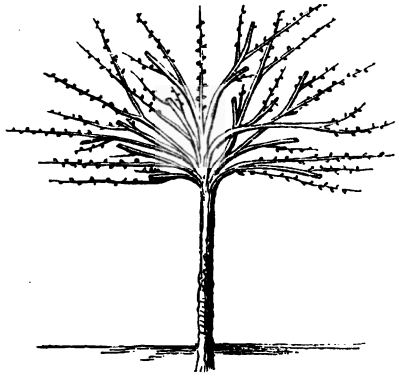

Fig. 34.

In cultivating a pyramid Cherry, it is necessary to induce the plant to form a good leader, and when it is four or five feet high nip the top out; but if the plant is not likely to break bud below, as may possibly be the case, the leaders must be stopped three or four times during its advance, to induce laterals from it to form the tree by degrees. These laterals must be frequently pinched back to induce sublaterals to fill up a symmetrical tree, and when the tree is formed, annual summer stopping may be practised to keep the plant in good order.

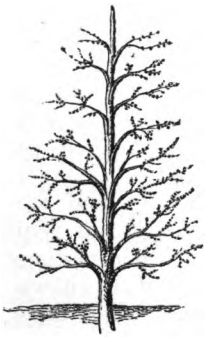

Fig. 35.

Fig. 36 is an example of a wall-trained Cherry pinched back, forming an abundance of fruit spurs, which will last for many years. Wall Cherries should be

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judiciously planted, or a failure will surely ensue. It is quite a mistake to plant them on a cold west or north border. I am aware of the reason why this is done, viz. because the Cherry being an early flowerer, it is thought by doing so to keep them back in this respect; but the main object is lost sight of, viz. that little or no sun can get at the roots of the trees, and so the poor, delicately constituted tree is chilled to death sooner or later; and if it lives as a plant no fruit can be expected from it, for of all fruit trees the Cherry requires more sun at the root than any other.

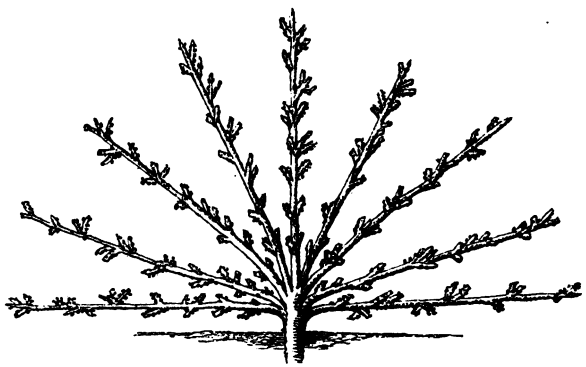

Fig. 36.

Properly speaking, there is no fruit tree (the Currant excepted) that will do well on a cold sunless wall. I am fully convinced of this from my own observation for a period of nearly forty years in both northern and southern counties; and I have noticed particularly that all are affected alike in such aspects. Lately I was in a garden which was of a cold flat situation, and consisted of a clay shillet soil. Here I observed that a fine Cherry-tree had perished, evidently from the coldness of the soil. Therefore, never plant Cherries on a cold northern or western wall.

Fig. 37 is an example of a standard Peach. The

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Peach is grown as a standard (on the same plan as we grow Apples) in some countries. In Texas, for instance, Peach-trees are planted in orchards, where they are very productive; but the fruit is generally small on account of the trees not being pruned. If these were thinned similar to Fig. 37, the fruit would be much finer. The example before us may be useful to those who grow standard Peaches, or to those who do so in such places as Texas.

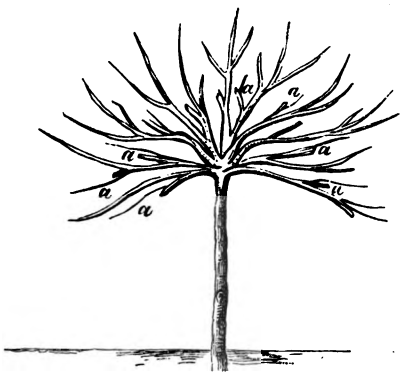

Fig. 37.

The pruning should be done soon after the fall of the leaf in those countries where the Peach will ripen on standards in the open ground, as we grow Apples in England, because there the climate must of necessity be very warm, without much winter, so that early pruning is necessary. Thin out the principals so as to open the head of the tree, and then shorten back to some young wood, *a a a a a*. Thus the annual pruning may be done to keep the tree to a moderate size, and to get finer fruit year by year.

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CHAPTER VI.

THE GRAPE.

The Pruning and Renovation of the Grape Vine.

Now that glass is so cheap there seems but little reason for growing Grapes out of doors; yet as it is not at present within the reach of many who like a bunch of Grapes, and who grow them on the walls of the house, some practical advice as to the management of the Vine may be useful. Even now, at this advanced stage of fruit culture, we find Vines of no use beyond being a shade on walls during the summer from want of proper pruning.

Not long since I was called in to see what could be done with one which was in exactly the same state as Fig. 38, which depicts a worn-out state so far as fruiting goes. Now, whenever a Vine gets into such a condition, whether indoors or out, there is but one remedy for it, viz. to cut it clean back as shown at *a*, Fig. 38. No half doing things of this sort will suffice.

The Vine is fond of a dry, high temperature. In the West of England a good crop of outdoor Grapes can seldom be had, notwithstanding that the climate is much milder than in the northern counties. Yet the Grape ripens well and with more certainty there than in the milder counties of Devonshire, Cornwall, &c. The reason is that the atmosphere in the northern and midland counties is drier, and of course not so dense as it is where it is heavily charged with vapour, which impedes the action of the sun's rays. When I first came into Devonshire I was surprised to find that the

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Grapes grown on walls were so slow in coming to maturity, and in most cases not even ripening at all, although the aspect was good. When I was practically attending Vines in the northern counties I never remember a crop of Grapes failing out of doors; but, on the contrary, I have seen nearly as good crops of the *Dutch Sweet-water* Grape out of doors as can be produced under glass in Devonshire.

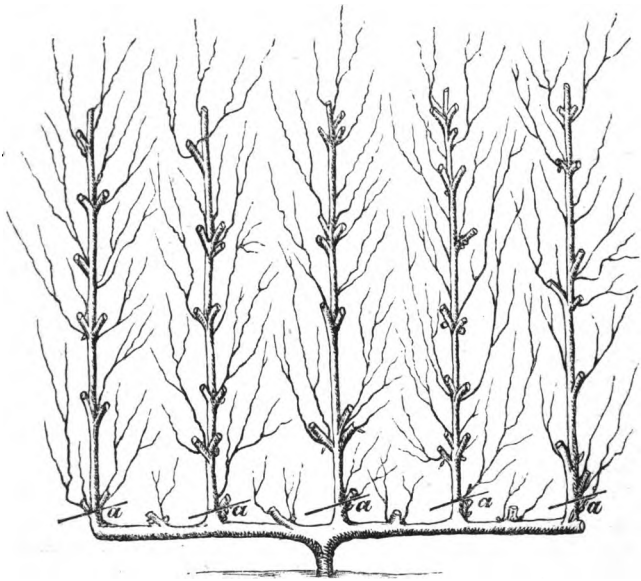

Fig. 38.

The Vine likes a dry subsoil, with a clear, dry atmosphere. To obtain good, solid, fruit-bearing wood, the main leaders should never be laid in nearer than two feet apart. The method of training is much a matter of taste, yet I am of opinion that the zigzag plan is most productive, on account of the check the sap receives by the sudden bends in the Vines, which partially prevents them from making too much wood

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at the extremities (which they are especially disposed to do), and by this check a more equal distribution of growth is produced.

There are two established principles of pruning practised in Vine culture. Each has its advocates, but as a rule in each case circumstances must determine which method to adopt. The constitution of the Vine itself for one thing, and the object in view, must be the two principles for one's guidance. For instance, a

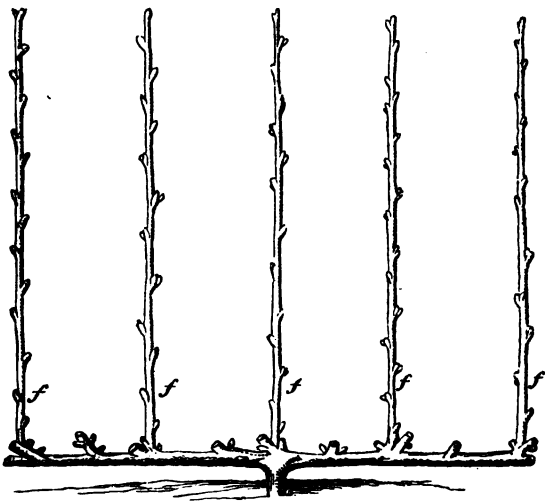

Fig. 39.

Vine that has not been thoroughly established for some years, and which has not a good supply of nutriment, cannot be safely pruned on the long-rod system here illustrated, Figs. 39 and 40. Young and weakly constituted Vines are soon ruined by this plan, while for thoroughly established and strong Vines it may be adopted to some benefit. The advantages are cleaner Vines, and finer fruit generally. This arises from a concentration of the virtues of the roots to the wood bearing fruit, chiefly as in *b*, Fig. 40, all up the Vine, which

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will carry two bunches each if required, although one is enough to each lateral. The rod *c* was made the previous season like rod *d*, the whole length of say fifteen or sixteen feet, and if the rod is well ripened and strong, a crop of two bunches per lateral is certain throughout the length of the rod.

But if the wood is weak, and grown in a house not well exposed to the light and sun's influence, the probability is that many of the eyes, *e*, will be abortive, and of course fruitless. Nor can the long-rod system,

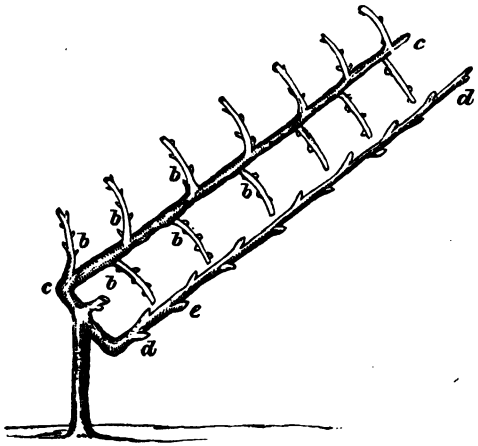

Fig. 40.

Fig. 40, be often safely adopted in outdoor Grape culture, as is seen in Fig. 39. This illustration is merely to show what the result of cutting down a worn-out Vine will be. These rods, *fffff*, may be pruned on the spur system, *g*, Fig. 41, and continued as long as a crop of good fruit can be had from the Vines, but as soon as signs of weakness appear, as in Fig. 38, cut the rods down as before described. Fig. 41 is an example of one pruned on the spur system, and may be practised upon any Vine, but is the only plan practicable on weak Vines, and such as can only

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be supplied with a moderate quantity of nutriment. These main rods, on which the spurs are, can only be allowed to reach the full length within one, two, or more seasons, cutting them back proportionably each successive season.

In pruning the Vine, under all circumstances use a sharp thin knife, and cut nearly close to the bud or eye, choosing a plump and a fully developed one for the base of the next year's supply, one bud or eye being enough. It should be pruned as soon after the leaves have dropped off as possible. All spray, *i.e.* weak stuff, that is sometimes found on badly managed Vines,

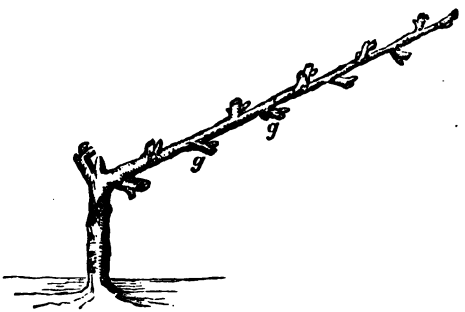

Fig. 41.

must be cut clean out, leaving only strong eyes for the following year's supply of wood; and if the spurs are too thick on the leader rod thin them out, cutting them clean off. It is bad policy in Vine culture to allow too many rods—*i.e.* never allow them to be so thick as to cause the young growth to overlap one another much. It is the sun that is wanted for the Vine.

In pruning the Grape in the vinery, all the leaders and the stems should be thoroughly cleaned at the same time, *i.e.* the outside bark that is in a measure loose should be peeled off to the smooth light brown bark; this will clear away embryo insects that may be

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deposited there, and will also expose the wood to the warm influences of the house. Every season the Vines should be painted over with soft-soap and sulphurvivium of equal parts and well mixed, being put on with a brush.

Summer Pruning the Vine.

Some good cultivators of the Grape adopt the plan of stopping the laterals at the joint at which the bunch of Grapes is situated, and some say stop it one joint above the bunch. The latter is no doubt the most reasonable. This should be done by snapping the young wood off at the joint, and not by cutting it with a knife, as is even now practised by some ignorant persons. The stage of growth at which this should be done is no doubt a matter of some importance. And in my opinion it should not be done till after the fruit is swelling off, as a check must arise from the sudden reduction of the young growth, which may deter the progressive development of the embryo fruit. After the fruit has reached a size to command a rapid and forcible draw upon the channels of the currency of the sap to itself, equal to the growth of the lateral on which the fruit exists, no check to the fruit will arise from the sudden stopping of the lateral. The bunch of fruit will get the immediate benefit, as the sap will be turned to it by such stopping, and the fruit being then in a stage capable of receiving the full complement of sap, no loss will arise; but it will be found that if the lateral on which the bunch is situated is stopped too soon there will be a tendency to make wood at every point accessible to the sap, and the fruit will not swell so fast as it would have done if left till it was in a more advanced state before the stopping was done.

All subsequent laterals must be duly stopped, and if the Vine is very luxuriant two bunches may be allowed on each with advantage to the Vine; for it generally happens with such Vines that when there is not an equal consumption of the supply of sap by the fruit of one bunch, the bursting of the eye will take place,

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and a troublesome emission of the sublaterals, consequent upon such supply being more than can be consumed by the one bunch. I think, upon the whole, that this indication may be a good guide in judging of the strength of a Vine, and a fair criterion as to whether it will carry one or two bunches of fruit to a lateral. A Vine may not be able to do this every season, but it may do so as long as the indications are good in reference to its strength.

The Colouring of Grapes.

Various are the reasons assigned for Grapes not colouring, and although this has little or nothing to do with the pruning of the Vine, yet I feel bound to refer to it here. Some theorists say that the colouring of Grapes depends upon the light, and some that it depends upon heat, while others assert that it is affected by the strength of the roots, *i.e.* the healthy state of the root; but I am convinced that it depends upon none of these individually.

The colouring of the Grape is caused solely by the oxygen of the atmosphere. It has nothing to do either with the kind of Grape or the state of the Vine. Those who cannot see this should go to Texas, where all sorts of Grapes grow wild on trees in the forests, in which country they are enveloped in shade and are crowded with other shrubs, which eat out a great deal of the virtue of the ground. In consequence of this the Grapes are small to what they would be if they were cultivated. Notwithstanding this drawback to the production of fine Grapes, the fruit ripens as black as jet throughout the whole bunches, although it is as sour as vinegar. The air of Texas is hot and dry. The black cluster Grape grown on walls out of doors will ripen as black as sloes in this country, notwithstanding that the ground is poor and the fruit small. So also will the Frontigniacs colour well on a good wall out of doors, while often they will not do so in a house. All this brings us to one conclusion, viz. that heat and air are the only conditions

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required for colouring Grapes, and not light or high cultivation. Here we solve the difficulty, and ascertain the cause why early house Grapes will not colour, viz. a high temperature and want of sufficient air.

It is not the high temperature that will do it without the same proportion of air. The oxygen acts upon the juices of the fruit, and changes the colour in proportion to the extent in which that gas is present. This is the whole theory of the subject.

There are features relating to the cultivation of the Grape which do not actually come under my present notice in a work on pruning only; but I may mention a plan I used to adopt for the admission of air into a house I had for Grapes. As the sashes of early graperies can seldom be opened, some means for the admission of air should be resorted to, and I have found that openings made in the front wall of the house close to the ground, about nine inches square, fitted with sliding shutters, are a most excellent method, supposing the house to be a lean-to, and the pipes close to the floor along the front. There can be no doubt but that is the proper place for them. Then these shutters may be opened every morning at nine o'clock, let the weather be what it may, except during a sharp cutting wind or frost. In fact they may be left open night and day from the beginning of May until the end of the summer, without any danger whatever; for if a good brisk heat is kept up in the pipes, the air coming in contact immediately with the hot pipes gets sufficiently heated to prevent any chill to the air of the house. Moreover, the heat gives vitality and speed to the air admitted, which is immediately distributed among the leaves and fruit, even causing a slightly visible motion to the leaves of the Vines, which is an evident token of its circulation. The openings may be three feet, a few inches more or less, apart.

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CHAPTER VII.

THE PRUNING AND RENOVATION OF THE FIG.

In the southern and western counties of England the treatment of the Fig differs considerably from that of the northern part of the country. In the latter it must be grown under glass to insure a crop of early Figs, or if grown on open walls it has to be matted up through the winter to preserve the young green fruit if possible. However, the chances are often but poor, should the winter prove a protracted or frosty one. But in the West of England, where the Fuchsia and the Myrtle attain to the size of a low tree, and Geraniums survive the winter for several successive seasons, in the mild counties of Devon and Cornwall, the Fig bears well and ripens to perfection on open walls as well as on standard trees, without any protection through the winter, the young Figs remaining on the tree and ripening very early, and the second crop ripening also.

The pruning of the Fig may be described as similar to that of the Grape Vine. The fruit comes on the young wood in the same manner, only there is this difference, that the late crop will remain on the ripened wood through the winter if the climate will admit of it, and then ripen very early, while the Vine makes the wood, and ripens the fruit at one and the same time, there being no second crop, or tendency to bear fruit on the late young wood, as there is in the Fig. This makes some difference in the mode of pruning.

Fig. 42 shows the manner of close pruning a

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trained Fig for a late summer crop only, as is shown in Fig. 43, *a*, which crop may be considerably increased in size and facilitated in ripening by stopping the laterals *b b b*, as shown in *c c c*. The advantage derived from this stopping one eye above the fruit is apparent in the difference between Fig. 43, leader *a*, and leader *d*, the laterals and the fruit thereon being of the same age. This stopping must be done as soon as the last fruit is fairly shown, one eye above it. The fruit then begins at once to swell off.

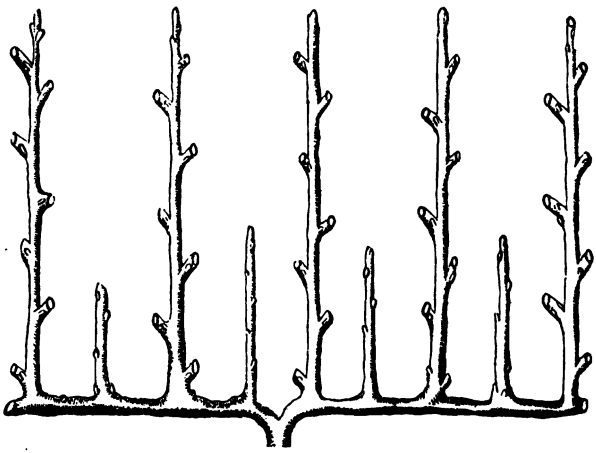

Fig. 42.

Some do not prune the Fig more than the summer stopping, but in such cases the trees get so bulky, and beyond what is neat and good-looking for a good garden, that some winter pruning is undoubtedly necessary. To such I would say, shorten in and thin out during the winter or spring, the latter being preferable. No great loss of fruit will be incurred if a reserve is made of such branches as contain an abundance of short fruit laterals, but cutting back and

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thinning out must be done at times, if not annually.

In the cold northern counties, where the Fig must be matted up to preserve the late fruit through the winter, rather a different plan must be adopted. To insure a crop of good early fruit they must be grown under glass or be planted on a warm south wall, pruned like Fig. 42, and the late crop well matted up with *Frigi*

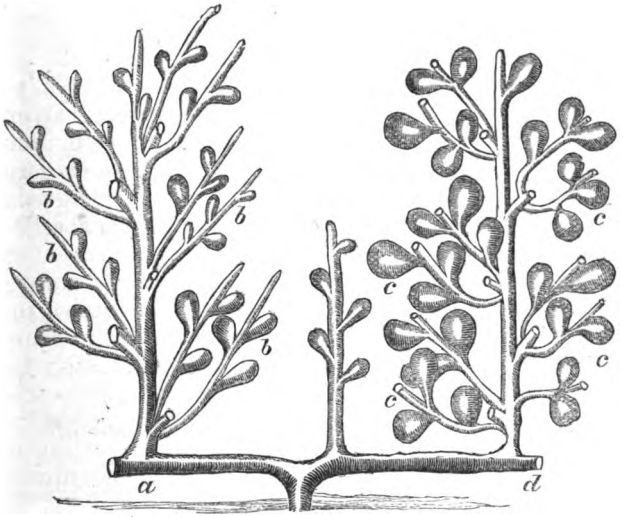

Fig. 43.

Domo and reed mats outside. Of course I do not mean that the young Figs must be pruned off, but, on the contrary, those made late must be matted up to preserve them, as is seen in Fig. 43, *a*.

Figs may be grown with ease by any one under rough-built glass where a western climate can be imitated, and no more pruning required than summer stopping, as already referred to. The fruit may appear an

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exaggerated crop as I have shown it in the illustration, but it is not so. Figs will bear equal to what I here represent them if treated accordingly, although they never show as they appear here, because the leaves hide the fruit from view. The leaves are not put in here, as they are not necessary, and to make the thing plainer.

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CHAPTER VIII.

THE PRUNING AND TRAINING OF THE GOOSEBERRY, CURRANT, RASPBERRY, ETC.

On the proper pruning of the Gooseberry depends the ultimate as well as the present well-being of the tree, besides other results in the shape of fine fruit. Some persons never prune it at all, while others do it without judgment, and both courses end badly. It certainly requires some judgment to know how to prune a Gooseberry-tree.

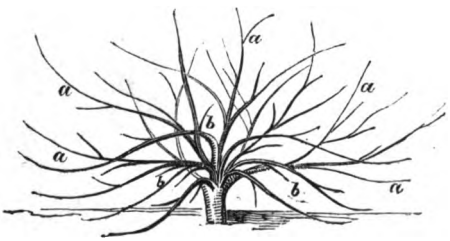

Fig. 44.

Fig. 44 is an example of a standard Gooseberry properly pruned, *a a a a a*—the last season's growth left at full length, which should be the case unless extending far beyond its limits, when it may be slightly shortened. The thinning out consists in first cutting away any old limbs filling up too much space and in process of decay; and secondly, thinning out the young wood, *b b b*, so as to open the tree sufficiently to

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admit the light and air, cutting it in to within a few buds.

All suckers must be totally eradicated from the base, but never cut back to the surface of the ground with the knife, which is frequently done, and is sure to end in the ruin of the tree. The cause of these root suckers is badly made cuttings in the first instance, and secondly, imprudently digging too near the stem, maiming the roots and turning them up to the surface, when they emit shoots; and when once the Gooseberry commences to do this it is difficult to prevent it continuing to do so afterwards.

The ground between Gooseberries should never be dug with the spade, but with a three-pronged potato fork, and then not too deep; eight or nine inches are quite enough. In making Gooseberry cuttings, be careful to denude the cutting of all the buds except one at its base and two or three at the top.

Gooseberry pruning should not be done much before the month of March; by that time it can be seen what is good fruit-bearing wood, and what is not. It often happens that, if pruned before March, the only fruit-bearing wood left on purpose for a crop has been completely divested of all the buds by the bullfinches, and sometimes by the sparrows, so that probably there will be no crop at all. But if the pruning is left till the buds get pretty forward the birds will not touch them, and a crop may be insured. If the finches have picked out the buds, which they always do along the long outward young wood, then it is best to cut it back to a sound bud, or a budless limb will result.

Espalier Gooseberries.

Espalier Gooseberries are very convenient things for small gardens, and form pretty low breaks around some quarters of the garden. These low espaliers may be pruned, as shown in Fig. 45, into long spurs, leaving three buds at the base of the last season's growth. These will bear fruit in abundance. Stakes of iron rod 2 feet

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or 2½ feet high will do well for these espaliers. Occasionally one of the old limbs will decay at the base,

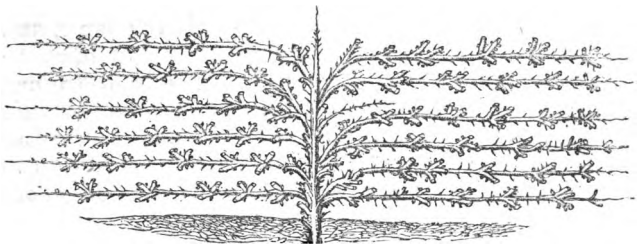

Fig. 45.

when a young leader must supply its place. This is the whole theory of pruning and training the Gooseberry, and it is very simple.

The Currant.

The pruning of the Red Currant and the Black Currant are two quite different things. It will be observed that the Red Currant bears its fruit upon the old wood or spurs seated on the old wood, while the fruit of the Black Currant is produced upon the young wood, *i.e.*

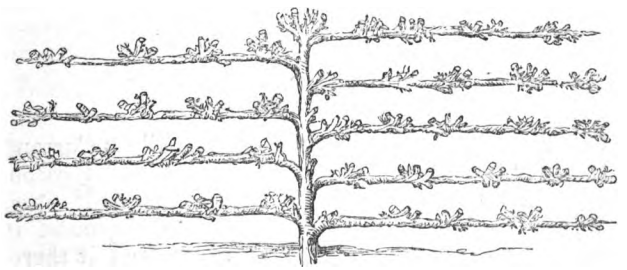

Fig. 46.

the fruit comes upon the wood made the preceding year. This circumstance at once suggests how to proceed in the pruning of each class. The Red Currant must first be formed into shape as a standard, as an espalier, or

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as a trained tree. The leaders must form the tree as it should be for some years to come. Then it may be kept to that, as a rule. See Figs. 46 and 47.

The pruning in each of these cases is the same, and a similar method must be adopted for wall-trained Currants of the Red and White kinds. Cutting close back every season to a bud will cause large old cluster spurs to be formed in due time, as is shown in Figs. 46 and 47. If at any time an extension of the tree is necessary, it is only needful to leave as much young wood as is required to fill up the space.

Fig. 47.

The winter pruning of the Currant may be done at any time from November until February, or even March, but not later. The ground where Currants are grown should be manured in the autumn, and forked over with a three-pronged flat potato fork ; and in the spring, as soon as the buds begin to swell, sow a heavy dressing of soot over all the trees and land. This will prevent the progress of the caterpillar, and at the same time manure the ground.

The Black Currant.

Fig. 48 is an example of a well-pruned Black Currant.

In order to maintain a healthy, robust, and vigorous Black Currant plant, and to insure fine fruit, it is necessary to heavy dress annually the ground in which it grows. It is a strong grower, and it therefore requires good land and a powerful stimulus to support its nature and to produce fine fruit. It will be seen by the illustration, as well as by its natural character, that the pruning of the Black Currant is quite a different process from that of the Red Currant, as I have before observed.

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The fruit comes on the young growth, *i.e.* the previous year's growth bears the fruit the following season. This at once points out the method of pruning to be adopted, and also what is required to get good fruit-bearing wood for each successive season, viz. a strong growth and a constant annual thinning out of the crowded branches, so as to keep the tree well open in the centre. Never spur in a Black Currant as in the case of the Red Currant. Cutting back some of the old wood is necessary, as is shown in Fig. 48, letter *a*.

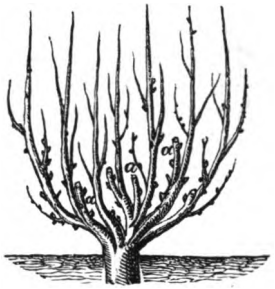

Fig. 48.

When Black Currants are trained on walls, the same rules should be observed for pruning as are adopted for the Grape Vine. All the finest fruit comes upon the previous season's growth.

The Filbert.

The cultivation of the Filbert for home use or for commercial purposes is a pleasant and profitable business, especially where the soil and climate are suitable. A mild climate is requisite as a rule to insure a good crop of Filberts every season.

It is an early flowerer, and should the weather prove wet and cold during the month of February (when it is in flower), no Filberts can be expected, except in the warm counties. This tree, like the common Hazel Nut, produces two kinds of flowers. The catkins, or what are vulgarly called "lambs' tails," are the male flowers, or those which do not bear the fruit, but only pollen. These, it will be observed, are suspended in a most graceful form from the young wood in great abundance in the early spring; and at the same time, if you look closely lower down on the same wood, and also on the

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older wood, you will see numerous minute pink-coloured brushlike flowers issuing from the hard wood, as it were. These are the fruit-bearing flowers, which should be in a fit state to be fertilised with the pollen falling from the male flowers above them at one and the same time; but if the weather is wet and very cold no Nuts can be expected, because the pollen cannot disperse itself sufficiently to fertilise the female flowers. This unfortunately often proves to be the case in cold counties, but in the western parts of England it seldom or never suffers in this way, and consequently an abundance of Nuts is certain.

The soil should be a somewhat gravelly one, with a good free drainage.

When Filberts are grown in private gardens, where neatness is an absolute necessity, the pruning must be done annually, but in doing so the young growth must not be cut down too close, for at the base of the last season's growth, or within a few inches of it, the male flowers and some female flowers will come. The former will spring from all the young wood, except just at the top; but if Filberts are not pruned they will get completely out of order.

The time of pruning should be regulated by the circumstances of the case. In a fickle climate like ours, it will be a very hazardous thing to prune before the plants have flowered; but as soon as that is over it may be proceeded with. As the male flowers are produced upon the last season's growth, none of that should be cut off before the flowers have dispersed the pollen. Then it may be cut off to within a few inches of the base, the tree first having been symmetrically formed similar to Fig. 49, to which style the plants may be kept for many years.

A Filbert plantation should be screened from the cold cutting winds from the east and north-east by one of Spruce Firs, or by some evergreens.

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The Raspberry.

The soil required for the Raspberry should be of a good light texture, having some sand in it, and mode-

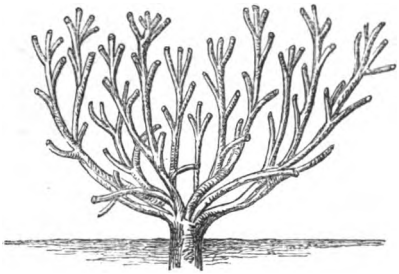

Fig. 49.

rately deep. Annual dressings with good manure are necessary to induce vigorous growth. These dressings should be put on and forked in all over the surface, never digging between this tree with a spade, nor with the fork too close to the main plant, except merely to stir the soil a few inches deep round the stool. All stray suckers which run from the main plant should be removed annually, and the manuring and pruning should be done in the autumn, say in November.

The pruning is simple, and can be done by any one. If the plants are strong, *i.e.* if each stool throws up more than four good canes five or six feet high, cut all down close to the ground, as shown in the illustration, Fig. 50. If the canes are weak leave three to bear fruit, and if very weak one cane will be enough. Cut off the tops of all the strong ones down to, say, five feet, which should be tied to a stake of

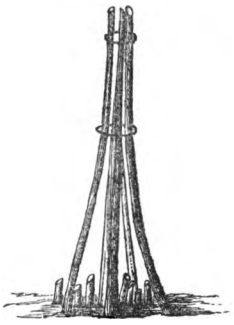

Fig. 50.

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the same height, or they may be trained similar to Fig. 51.

It must be borne in mind that all those canes that

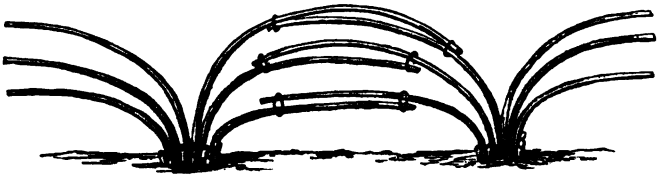

Fig. 51.

have borne fruit never do so a second time, but die in the autumn.

It is not a good method to plant the Raspberry above one or two years old at the most.

The Quince.

The pruning of the Quince may be assimilated to that of the Pear. Quinces are generally planted in some out-of-the-way corner. It is certainly necessary to put them where moisture abounds, for they seem to be partial to water, but at the same time an open spot is also necessary. In pruning the Quince observe to thin out the main branches, and then cut back what is out of order and fruitless.

The Mulberry.

Generally the Mulberry takes its own course, and seldom or never gets pruned. This may not be needful in order to produce fruit, but cutting-in is absolutely necessary to prevent future disasters; for as the Mulberry gets old it becomes heavier at the extremities, in which case the main limb cannot sustain the weight of so much foliage, and so it is sure to be damaged by the high winds, which often blow off half of it, thereby causing the loss of a large and handsome tree.

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Now, if the Mulberry is shortened in judiciously before it gets old and loaded with thick branches at the extremities, which it is sure to do, the main limbs will get more robust, and possess an additional strength to resist the powerful winds of the future, and so obviate what often happens to these trees.

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PART II.

THE PRUNING AND RENOVATION OF PARK AND AVENUE TREES.

As a rule trees for avenue planting, especially for public road work, are not well selected, and they are, moreover, generally neglected until it is too late to make handsome trees of them, suitable for a well-devised public promenade, especially for a high-class community.

I observe that trees not at all suitable for this purpose are frequently planted, which, after a few years, have to be cut down. The common Horse Chestnut, for instance, is mostly selected and planted at intervals along with, perhaps, the *Lime, Turkey Oak, Elm,* &c. Now the Chestnut will outgrow most other forest trees; the consequence is an irregular avenue; and then after awhile a high wind blows off a large limb and makes the whole thing most unsightly. Then the Chestnut has to be cut down, when a vacancy occurs at once, thus spoiling every good feature in the avenue.

Now, when this is the case, or rather when the Chestnut or any faster-growing tree than the rest is planted for an avenue, let it be annually cut back so as to make it meet the object in view. But I advise that no such class as the Chestnut be planted with the Lime, Elm, or Green Oak for street purposes, nor, indeed, as a selection for any avenue at all. Variety is pleasing to be sure; then select the Lime, the Evergreen Oak, the Elm, and the Sycamore. These may be made to coincide with each other as regards growth. The Ever-

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green Oak is the most suitable for a street avenue, as it requires but little pruning, and that is easily done with a long-handled *averruncator*. The LIME can be planted with it or alone for such promenades. This tree is of slender growth, and can be easily pruned by the same means, and if at any time it gets too large it may be cut back to any extent.

The ELM is a very good tree for street avenue work, and can be pruned to any extent. The SYCAMORE is a handsome tree for this purpose, especially when in flower and bearing the seed. It may be pruned to any extent, and the branches shortened in when they get beyond the desired limits. The Turkey Oak is a handsome tree, but unless it is pruned annually it will soon make but a poor appearance in this situation.

The BIRCH is also a very graceful tree, and the *Poplar* (the upright Poplar) is a good avenue tree, causing but little trouble and living to a great age. It should be planted rather closer than most other forest trees. No pruning is required for it.

The PLANE-TREE is a fine-foliaged deciduous kind, suitable for the street, but it is better adapted for road avenues, where it may be allowed a rather freer scope to develop itself than ordinary streets will admit of. It requires the same kind of pruning as the Lime, and may be made a beautiful summer ornament if not pruned in too close.

When any of these trees, except the last named, are planted for street avenues, pruning should be commenced as soon as they begin to grow freely, cutting-in the ends of the branches so as to induce a compact and symmetrical growth; and as soon as they have attained to their utmost limits they should be annually pruned in with the *averruncator*. It may be done in the autumn for deciduous kinds, but in the spring for the evergreen kinds.

The RENOVATION of avenue trees consists in cutting back severely such as will bear it, and the complete decapitation of some. I am sometimes sorry to see old-established healthy trees completely extirpated when

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they belong to an avenue, because it causes so many years' vacancy and loss of beauty. Nor is there really any need for it, for the trees enumerated above are well able to bear a severe cutting back; and if due attention is paid to the early pruning of them and the formation of a compact growth no such severe process will be required. But if at any time it is necessary, no one need be afraid to cut the heads close down, as is seen in Fig. 52. Fig. 53 shows the tree recovered by one season's growth, supposing it to be an evergreen *Oak*, *Lime*, *Elm*, *Sycamore*, or a *Chestnut*. Fig. 53 is a fair illustration of the thing.

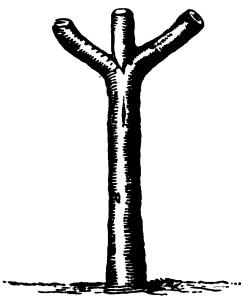

Fig. 52.

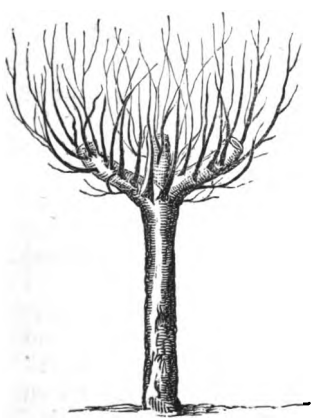

Fig. 53.

PARK TREES will seldom require any pruning except to shorten in those branches which have advanced too freely, and have consequently distorted the tree, and which will in all probability get blown off by a high wind, as is frequently the case with the Horse Chestnut. The evergreen Oak which I refer to is not the *Ilex* Oak, but the "Lucombe Oaks," of which *Crispa* and *Dentata* are the most beautiful varieties. *Suber* is also a very beautiful evergreen Oak. The Cork-tree will do well in Devonshire, and is admirably adapted for superior park and open street

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or road avenue work. All these bear pruning well, and moreover carry a handsome foliage.

A street avenue may be formed of the common Yew, *Ilex* Oak, and the *Lignum Vitæ*, or Lime, although the last named will be difficult to keep as neat as the first three. Still by clipping two or three times during the summer the Lime may be made to present a much neater appearance than is generally supposed, and it will bear any amount of clipping or cutting.

Now, if constant attention is paid to such summer shades, nothing will better repay the inhabitants of hot towns like Torquay in summer, than avenues or rows of trees planted next to the shops. They are almost necessary adjuncts to places of such beauty. Shade is the thing wanted during the summer months in places which have so many attractions.

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PART III.

THE PRUNING AND RENOVATION OF FLOWERING AND OTHER SHRUBS.

CHAPTER I.

THE ROSE.

THE various classes of the Rose differ in constitution and disposition to a considerable extent, and unless these characteristics are well understood much disappointment will arise from improper pruning. As an example of my meaning I will name one or two—COUPE D'HÉBÉ, BRENNUS, the BEAUTY OF BILLIARD, and the double "PERSIAN YELLOW." The first is one of the most distinct and beautiful, as well as one of the most perfect Roses extant—a Rose that no garden should be without. All three of the above-named before the Persian Yellow are of the class that will not bear the knife like the Chinas and the Perpetuals.

Fig. 54 is an illustration of the way to prune strong-growing Roses like *Brennus, Coupe d'Hébé,* &c., as standards: *a,* the last season's growth cut back to within five or six buds; *b b b,* the same growth of the young wood cut back to within one or two buds to give a supply of wood for flowers the following season.

Fig. 55 is an illustration of the proper method of pruning the Austrian Brier, or Persian Yellow Rose: *a a,* the year's growth, merely cutting the points of the shoots off; *b b b,* the same growth cut back to within two or three buds for a supply of wood for pro-

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ducing flowers the following year. Each of these cases may be taken as an example of the mode of pruning the numerous strong-growing Roses on the Dog Rose as standards or dwarfs, and the Briers also.

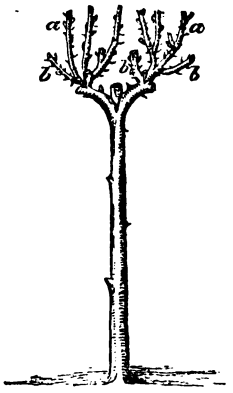

Fig. 54.

It is absolutely necessary to get a strong growth annually on all Roses, in order to obtain fine flowers, especially in the case of the Austrian Brier. But at the same time particular attention must be paid to the specific manner of pruning, or no flowers will be had after all. There are two causes why so many people fail to grow the Austrian Brier well. The first is that the Rose is not grown strong enough to get good flowers, and the second is in consequence of the first failing, the growth not being strong, or rather the ground not being good enough, the Rose cannot supply wood to meet the demand that must necessarily be made upon this class to maintain year by year both wood and flowers at the same time. And as there is not a supply of good wood the flowers are poor and puny, and the indiscriminate way in which it is pruned proves fatal as regards a crop of flowers. This, like all

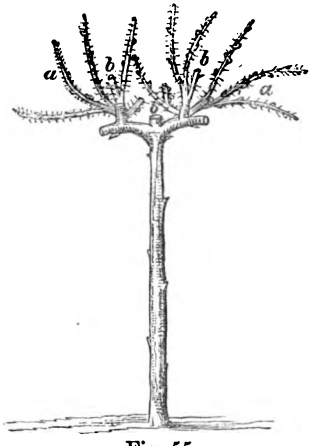

Fig. 55.

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other Roses, must be grown strong, and then the knife must be used judiciously.

Fig. 56 is an illustration of a pruned Perpetual, China, Moss, or Gallica Rose. This supposes that the classes are grown strong, but if they are not, then the weak growth must be cut close out, and the flowering wood cut back much closer than is here represented.

Fig. 57 is an illustration of a well-grown and established pendulous or Weeping Rose. The pruning of these Roses consists of two methods. First, if a yearly luxuriant growth can be maintained, then the whole of the preceding year's growth that has flowered may be cut out close to the head, and its place filled with young wood which has been made during the summer. This is what is really wanted in pendulous Roses for a good and handsome flowering specimen. But if the plant will not maintain this, then spurring must be resorted to. In doing this, the leaders *a a a a* of Fig. 57 may remain for two or three seasons, and be spurred in after these leaders have flowered, which they will do freely from every bud the first season after they are made. The lateral growth may be cut back to one or two buds as in *b b b*. In this case a thicker head can be secured as a well-formed and handsome specimen, and an abundance of flowers will be produced for the time; but ultimately some sorts will give a paucity of flowers, and poor ones as well. When this is the case the leaders must be one-half removed at the least, or the head cut off close to its base. The plant should be well manured and a new head of strong growth induced, so as to form a fresh plant; but I always found it much the best plan to get long rods every season, and then to cut the old ones out annually.

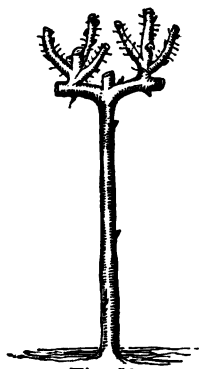

Fig. 56.

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The RENOVATION of Roses worked on the Dog Rose consists in producing an entirely new plant. It always becomes necessary in the course of a few years, more or less, according to circumstances. These circumstances have to do with poor rocky soils and climate. In these soils, such as are found in and about Torquay, and in such a climate, the Rose worked on the Dog Rose as a standard (for there is no other stock which will do for standards) degenerates fast and much more quickly than it does in a colder climate and in clay subsoils. In the former case the difficulty in the way of renovation is greater than in the latter, but in each the only way to reinstate a good favourite Rose is to cut the heads as close off as possible, and to take the plant up. Then cut the roots well in, open a good hole, and put in a barrowful of maiden soil with a little decomposed manure, and the ensuing season a renovated constitution will be developed.

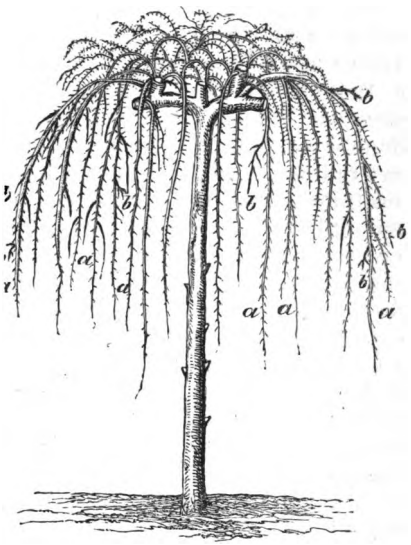

Fig. 57.

Again, if the Rose has degenerated chiefly through the climate—as it will soon do in such exciting temperatures as Devonshire and Cornwall—then cut the head completely off close under where it was budded; let the stock remain for a season, and bud it the next following summer. Let it remain one season if the

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ground is poor, then take it up, cut the roots back, and replant it. Thus a good Rose may be obtained. In some climates and soils it is necessary to plant Roses every few years if they are not well managed.

The Pillar and Climbing Rose.

Many of the Roses budded on the Dog Rose make magnificent pillar or climbing specimens, such as *Brennus, Blairii,* and *Gloire de Dijon.* There is nothing in all the glorious art of gardening that can equal a well-devised pillar, fifteen or twenty feet high, composed of each of the above-named Roses. They should be worked either on dwarf stocks, close to the ground, or from their own roots, and be planted in deep and rich soil. But the true classes of Pillar or Climbing Roses consist of rather a different thing; and among them I may mention as a guide *Felicite perpetue,* which is a true Pillar Rose.

The pruning of each of those named is different. In the first three cases it is absolutely necessary to induce a strong growth by means of heavy dressings, so as to get some permanent rods as a base to cover the pillar or wall as soon as possible, then to spur them in upon each bud throughout those rods. But in the case of *Felicite perpetue,* and all of this class, which naturally make rapid growth without being so much coaxed to it, a different method may be adopted in pruning them.

The Banksian Rose belongs to this class of growers. It is seldom that we see an old fully developed Banksian Rose bearing a rich crop of flowers; but, on the contrary, we more often find them in great luxuriance, some twenty feet high, covering an extensive wall, bearing no flowers except a few at the top. This Rose may be an exception to the rule, but the proper treatment for a certain annual crop of flowers is nearly identical with *Felicite perpetue, Dundee Rambler, Queen of the Belgians,* &c. While, however, these last named may be spurred in for two or three years (and a little

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longer in some cases), and still insure a moderate crop of flowers, it is seldom the case with the Banksian Rose.

The first season the young rods are made, or rather the season after they are made, an abundance of flowers can be grown from them if they are well ripened, for these will put forth a cluster from every bud throughout the rods, and in the following autumn (the best time, I think) each of those laterals that have borne flowers may be cut back to a bud or two at the base. These will then bear some flowers for one season; but at the base of the leaders, and perhaps half-way up, none, or but a few, will be had from those spurs after this method of pruning. Nothing but pruning on the long-rod plan annually will insure a full crop of flowers upon this Rose; therefore, to be successful in flowering the Banksian Rose, some of the leaders must be cut back nearly down to the base every season, and these will give long rods annually.

This is the proper method of pruning all Climbing Roses, especially for pillars, walls, &c.; but, as I have already observed, most of these Roses may be spurred in for a few seasons, although ultimately no flowers will be had from towards the base of the plant, nor, indeed, for half-way up the rods or leaders. When this is the case *renovation* must be resorted to either in part or entirely. In part, *i.e.* cut one half of the leaders quite down to the base one season; these will give strong shoots, perhaps twelve or fifteen feet long; and the following season cut the other half down. This do every alternate season. It is the only way to insure a full crop of fine flowers from the base of the plant up to the top of each rod.

Chain or Festoon Roses.—Any of the free-growing Roses may be employed for this purpose; but I am of opinion that the best kinds to employ are those that will make strong growth and give robust spurs along these rods, and which will bear flowers successively every season upon those cut-back spurs. And I think none are better adapted for this purpose than

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Fig. 60. Fig. 59. Fig. 58.

Gloire de Dijon, Brennus, Blairii, Great Western, Jaune Desprez, Luxembourg, Cloth of Gold, and a variety of other *Noisette* Roses. These are, I think, better suited for festoon Roses than such as *Felicite perpetue,* from the fact that when once Roses belonging to those classes have filled the chains, pillars, or arches of wire, they can be spurred in annually all along each main leader.

If the Ayrshire Roses are used, unless a constant vigorous annual growth can be maintained, ultimate failure in regard to flowers must ensue. This will never be the case if the above named, selected from the various families, are used, and good annual dressings with strong manure are given them.

As soon as the flower buds are formed, give the plants a thorough soaking with three ounces of guano to one gallon of water. This will not only develop fine flowers, but also induce strong stuff on the spur for the following season. Then prune this off to a bud at the base every autumn;

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thus a constant annual crop of luxuriant flowers will be secured.

Figs. 58, 59, 60 are illustrations of a Pillar Rose pruned on the permanent spur system, *a a a;* B B, the Rose trained on permanent festoons, *Brennus, Blairii, Gloire de Dijon,* &c., being well adapted for this purpose. When the spurs get old and weak, as they will do ultimately (and if the plants appear weak, it would be best to cut them clean down to *c c c*), give the roots a heavy dressing with manure and some strong guano water in the early spring; this will induce the plants to throw out vigorous shoots from the buds at *c*, which will soon fill the pillars and festoon chains or wires.

Thus far I believe it will be found that, as regards the pruning of each class of Roses, every information has been given that is necessary as a guide for those amateurs and inexperienced professionals who often get perplexed in the matter. We often find some beautiful varieties of the Rose giving few or no flowers for want of judicious management.

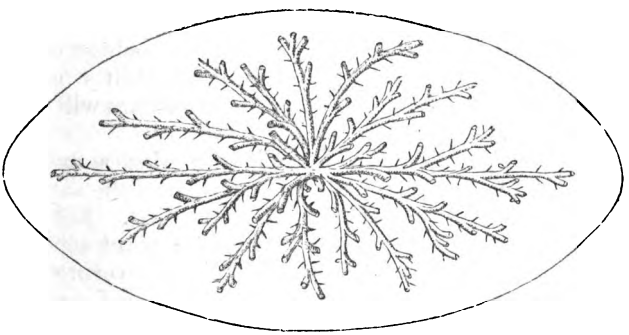

Fig. 61.

An example of a hybrid perpetual Rose planted in a bed, trained down, and pruned annually.

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CHAPTER II.

EVERGREEN SHRUBS, ETC.

The Laurel.

Notwithstanding that the common Laurel is so generally grown, either for use or ornament, we often find it most improperly treated. This evergreen and in many respects beautiful shrub is very frequently either badly pruned, or not pruned in due time to maintain its ornamental character.

The Laurel should never be cut in with shears, as is frequently the case; for by pruning it in this manner to reduce it or to keep it in good order, all the beauty of the plant is destroyed by the leaves being cut in twain, and ultimately all the dead points of the shoots that have been cut off with the shears will show themselves.

The clipping of the Laurel with shears cuts the leaves in two and checks the circulation of the sap, and is often a main cause of its final destruction. Let those who do so consider that the leaves of a plant act as do the lungs to animated nature, so that by severing those organs the plant is deprived of its main developing functions; the consequence is a present failing of colour and health, and a final failure of the plant altogether. But when common Laurels require cutting (which they always do to keep them in good condition, and well feathered with foliage below, a feature of much importance in all ornamental evergreens, whether for detached shrubs or for break-fences) it should be done with the knife or a pair of *sécateurs;* only, by

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whichever of these tools it is done, be careful not to cut the foliage in twain.

Two or three years after Laurels are planted some cutting back will be necessary, for it is while it is young that a good foundation for a permanent, handsome plant is to be formed. It is of little or no use to allow the plant first to grow to its utmost limit, and then to cut off one-half, or perhaps be compelled to cut the whole of it quite down.

When a Laurel has by some means or other become of no value as an ornament, or useless for the purpose for which it was intended, it is always the best plan to cut it completely down during the autumn or early in the spring. Numerous strong shoots will then spring from the stool. These should be cut back a little in the following spring, to insure a full-feathered plant below.

The Portugal Laurel.

The Portugal Laurel is not such a fast grower as the common Laurel, but it is one of the best of the evergreen ornamental shrubs. It should be pruned through the summer by merely taking off the points of the leaders; this will induce a handsome and close growth. If at any time it gets too bare at the lower part, cut it back during the early spring or in the winter. If standard Portugal Laurels for the lawn are wished for (and for this purpose they are very handsome ornaments), cut off all the under branches close to the stem, but not at the top, and allow the leader to advance as fast as it can. When it has reached the desired height take the top off, and continue to nip out every shoot as soon as it has made six or seven inches of growth. This will induce a handsome umbrella-shaped head, representing an Orange-tree with its dark foliage.

Portugal Laurel fences are remarkably close and beautiful if constantly summer pruned. Never sever the leaves by using the shears, for if so clipped it will utterly spoil the beauty of the whole thing, and render

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the effect quite at variance with what it is capable of producing as an ornamental shrub of the first character among evergreens.

Whenever the Portugal Laurel gets out of order, or too large, cut it back to what is desired. If it is cut into the blank and barren wood it does not matter, it will break again quite freely from the budless wood; so that let a plant be ever so old, no fear need be entertained as to whether it may be fatal to cut it back quite into the barren and leafless wood. I mention this particularly, because I have found those who have been diffident about severely cutting back old Portugal Laurels.

The Arbutus.

The Arbutus is a shrub that will soon get barren of foliage below if not prevented from doing so by due attention. Generally we find the Arbutus an eyesore in good grounds rather than a beautiful evergreen ornament, bearing both flowers and scarlet strawberry-like fruit at one and the same time. To prevent it becoming barren in this way some annual pruning will be necessary. As soon as the plant has grown to, say, two feet high, nip out the leaders of all the principals, and continue to do so every summer or early in the spring; by this means a handsome and symmetrical plant may be maintained for an indefinite period.

An old barren plant may be renovated by cutting it quite down to within a foot of the ground, or by shortening in the limbs, similar to Fig. 62. The line *a* indicates where an old Arbutus may be cut down to, if not past age and not decayed. It will generally give young growth at the base after being cut down, if it is sound. Early in the spring is the best time to do this.

Fig. 62.

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The Bay-tree and the Laurestine.

Both of the above may be treated in a similar way as regards the management of the plants, as they are somewhat alike in their constitution. To form good specimens of each, some little attention must be paid to them while they are young. Taking out the points of the leaders for a few seasons will induce a bushy habit, and cause the plants to feather themselves well down to the ground, in which consists the beauty of all evergreens. If at any time either of these shrubs gets overgrown and barren below, cut it quite down to the ground, or to within a few inches of it, and an entirely new plant will be formed. This cutting down should be done in the months of March and April. It must not be done in the autumn in cold counties, as probably it would expose the stools to a severe frost, which might kill them.

The Holly.

Some difficulty attends old Hollies in the pruning of them, especially some of the choice sorts. If some of the variegated kinds are allowed to get too old before they are pruned into a pretty shape, it will prove fatal to the beauty of the plants to cut them severely; but if the points of the shoots are taken off while they are young, beautiful, symmetrical, and thick-foliaged specimens may be formed. The Green Hollies, if cut quite down to the ground, will throw up an abundance of young shoots; but this kind of pruning of the variegated sorts can never be done safely, because they are all grafted on the common green kind, and if they are cut down to the stock they will throw up green stuff instead of variegated foliage.

The pruning of Hollies should be done through the summer, when they are growing, but not too late. Time should be given for them to make some growth at the points. Nipping out the ends of the shoots is the best way of pruning the Holly.

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The Double Furze.

If the Double Furze is to be kept in good and continuous order for many years, it must be well looked after in its early stages. I was well acquainted with some grounds where there was an ornamental Double Furze fence planted as a finish to a wall adjoining the public road, which road was much lower than the grounds, so that the soil was on a level with the top of the wall. On the top of this wall was planted (of course inside in the soil) a row of Double Blossom Furze, forming for a great length a hedge quite thick, which, when in flower, was one of the most splendid and singular objects conceivable in the course of a day's ride by railway. Well, this beautiful flowering fence was getting at last beyond its limits. Now, what was to be done to reduce it? "Why," said some one, "cut it down to the ground, it will shoot up from the root." Alas for the attempt! which proved a mistake. The fact is, if the Double Flowering Furze is allowed to get old and barren and hard-wooded below, it is ten to one, if it is cut down to the ground, but that it will die.

The proper time for pruning the Double Furze is as soon as the bulk of the flower is over; but in the young stages of its growth merely cutting out the points of the leaders with a *sécateur* frequently is all the pruning that is required to maintain a well-feathered specimen down to the ground for many years. Nor can a more beautiful ornament on a lawn be found than this shrub when carefully attended to while it is young.

The Berberis.

There are two classes of the Berberis, the one evergreen and the other deciduous. Some of the latter are not very ornamental shrubs, but *Vulgaris* is useful on account of its pretty fruit, which is of a nice acid when used as a pickle. The evergreen varieties are useful, and many of them are beautiful ornaments, fit for the most prominent places in the pleasure garden, and among these none are more so than *Darwinii*.

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The pruning of the strong-growing deciduous kinds consists in cutting-in early in the spring to a good shape. The evergreen varieties may be frequently nipped in at the points of all the leaders to form handsome symmetrical specimens. Old deformed plants may be renovated by severely cutting back in the summer after the flowering season is over.

The Tamarisk.

This is a rather strong-growing shrub of the deciduous kind, being of a beautiful light green colour, and having a fine foliage.

The pruning of this shrub or low tree must be well attended to, or it will grow quite out of good order, shape, and form. The proper way to grow the Tamarisk is to make a standard of it, and then to prune it early every spring by cutting back the long branches. All the dead wood in the tree must likewise be cut out. By this treatment it will present quite a different appearance from what we generally find it. The Tamarisk is a miserable-looking tree if neglected, while a little annual pruning completely alters the case in every respect.

The Escallonia.

This is one of the most beautiful flowering evergreen shrubs we possess. It is of a free growth, thick, and of a dark green foliage, being also a most prolific flowerer. In the midland and northern counties a sheltered wall is required for it, but in the south it flourishes without any protection through the winter. *E. Macrantha* is a fine and red-flowering variety, being profusely covered with flowers as handsome as a Heath.

This shrub requires annual pruning similar to a soft-wooded Heath, *i.e.* merely nipping out the points of the leaders, which will induce a thick and compact growth, with an abundance of flowers. Old overgrown plants may be cut back severely, in which case new ones will be quickly formed.

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The Garrya.

This evergreen shrub has the appearance of an Oak as regards its leaf. It is exceedingly handsome in the early spring on account of its long, pendulous, and graceful catkins, which are produced on the preceding year's growth in great abundance, giving to the plant an air of beauty not often found among this class of hardy shrubs. A shrub of this kind nicely trimmed up to a four or five feet clear stem, having a symmetrical, umbrella-shaped head, and in good health, and placed on a lawn, forms an object worthy of such a situation where it can thus display its character.

Fig. 63.

Its pruning consists in carefully cutting-in any points which are calculated to distort its true symmetry. Overgrown and old plants may be cut back, as in Fig. 63, which represents the Garrya as a lawn tree. This may be taken as an illustration of a well-trained specimen which has grown freely, and been annually pruned.

The Acacia.

There are two classes of the Acacia, one that bears pea-shaped flowers, and the other imperfect flowers, *i.e.* those which have no perfect petals, but are composed of brush-like flowers. Each of these classes requires similar treatment in the pruning. The points of the shoots should be nipped out while the plants are young, in order to obtain compact and symmetrical plants. But in the event of a plant getting overgrown it may be cut back severely, when, if not

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too old, it will break into fresh growth, thus forming a new tree.

There are some that are remarkably handsome in their foliage and general character. One in particular is called the *Locust-tree,* which is very beautiful as a lawn tree.

Fig. 64.

Fig. 64 is a fair illustration of the tree, which in the summer is densely clothed with foliage as thick as possible, with its overlapping pinnatifid, bold-featured, and dark green leaves, giving the tree a singular and uncommon appearance, different from all others.

Fig. 65 shows a feature of the seed pod of this tree, which attains to as much as nine or ten inches in length, and an inch wide, and comes on the tree in numerous clusters, which are, when nearly ripe, of a beautiful scarlet colour, giving to the tree a splendid appearance. These seed pods become of a mahogany colour as they get older, which gives a richness to the appearance of the tree. I had some pods of this seed sent me in 1878 from Texas, where the trees grow in abundance. I strongly recommend this beautiful-foliaged plant as a lawn tree in sheltered places.

Fig. 65.

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It may be necessary to cut it in at times, or even to thin out some of the branches, and this should be done in the spring.

On the Pruning of the Coniferæ.

All the Coniferæ will bear the young growth stopped at the ends of the branches, but not any severe cutting back or pruning into the old wood, with a view to obtain new growth in order to renovate the plant. The *Pinus insignis* will bear more pruning than most of the Pines, but no attempt must be made at cutting it back into the old wood.

The Pines and all the *Abies*, as well as the *Cupressus* tribes, may be stopped at the ends while the plants are young, with a view to induce symmetry of character, or to obtain a limited development of the specimen.

It sometimes happens that a beautiful specimen is found to be planted in a spot where a very limited space can be allowed it. I have often seen this, when not knowing what to do, or through not actually attending to the early pruning of it, and the valuable plant has had to be cut down. I have seen a *Pinus insignis*, valued at £100 or more, destroyed on this account.

Once for all, I have to repeat that all the *Coniferæ* may be pruned, but only by stopping the young growth, or by very careful knife-pruning of the young branches during the early stages of the growth of the plants. Old branches may be thinned out, but not with the object of obtaining new growth from them.

The Thorn.

It often happens that a fine standard Thorn gets beyond its bounds and intrudes upon some other object. Whenever this is the case, prune the plant as much as you choose, there will be no danger of such a course being fatal to it. When a specimen

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has exceeded its limits it is a good plan to cut it back, so as to get a new symmetrical head. The same may be done when it has become old and poor.

In reference to Thorn hedges much may be said. For the first few years after one of these has been planted some careful attention must be paid to the cutting back by closely clipping it, or no good fence can be obtained. It is necessary, after the hedge has been planted one year (or two years at the most), to cut it down to within a few inches of the ground to induce a bushy and thick growth close to the ground; then after a season's growth the young hedge should be clipped on the top, but not much on the sides. After this it is only necessary to run the hedge-shears over the top, taking off a few inches to induce a thick growth; this must be done annually, two or three times during the summer growth, until it attains to the desired height, to which it must be kept by summer clipping every year. The same thing applies to the Privet hedge.

The renovation of old hedges is best effected by cutting them quite down to the ground, or to within a few inches of the surface of it. Cutting out some of the old fence and leaving here and there a long branch to plash down is bad hedge management.

The Spanish Broom.

The Spanish Brooms, both the white and yellow, are remarkably beautiful as ornamental flowering shrubs. As detached plants on lawns they present a singular effect when in flower, for being of a very flexible nature they are easily moved by a slight breeze, and when they are in full flower this has a most fairy-like appearance in the graceful wavy motion of the flower spikes. They also form superb four-feet standards, when grafted on the Laburnum, for the lawn.

The pruning of these Brooms requires some little care—annual cutting back of the dwarf plants being

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necessary. This should be done immediately after the flowering is over, so as to give the plants time to make new growth, and to ripen that new growth before the winter. They may be cut back to any extent.

As grafted standards, a somewhat different plan must be adopted in pruning them. These should be well or quickly grown; then, as soon as they have done flowering, thin the head out, leaving long leaders and sufficient laterals towards the crown of the head to insure a healthy supply of young wood for the following season's flowers, in a similar way to which the climbing Rose is treated. When the leaders get too long and barren cut them back. It will be found necessary to thin these grafted Brooms out annually, or they will soon get too thick and full of dead wood, when they will lose their graceful character as lawn trees.

The Weeping Willow.

The Weeping Willows are most beautiful objects when well grown. It is frequently necessary to prune them to prevent deformity in their appearance, for they will often grow irregular, doing this more on one side than on the other, and so on. Some judicious pruning will be necessary to prevent this—severe cutting back in some instances, and no cutting at all in others. Thus a plant may be made to grow in a symmetrical form. Old and deteriorated plants may be cut back severely to induce a new development altogether; and some frequent thinning out will be required to induce an equal and graceful habit.

The Weeping Ash.

What has been said about the management of the Willow applies to this, except that completely cutting it back may not be advisable, nor even necessary. When a Weeping Ash is to be planted a good deal of

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preparation of the soil is needful, such as trenching deep and turning in a good lot of manure. This will induce a vigorous development of the head. Some pruning out of the irregular and stubborn growth will be necessary at first, and also some training of the shoots while they are growing will be required by placing a hoop over the head, to which tie the shoots in a regular manner.

Well-developed and old plants require frequent thinning out, and the dead wood annually cut out. Very often stubborn upright shoots will spring from vigorous old specimens at the crown of the plant. These should be cut clean off as close as possible to the base from where they spring; for if these sporting shoots are merely cut back to within an inch or so, they will continue to give the same class of wood for years, which detracts much from the proper growth and character of the plant.

THE JUDAS-TREE. (*Cercis Siliquastrum.*)

In Texas, U.S., this variety grows in abundance, and is to be seen there in the spring, before the leaves appear, most conspicuously covered with its pink-red *papilionaceous* flowers. These spring from the hard or ripened wood all the way up the branches.

This tree is of a beautiful deciduous kind, not of large growth, but it may be utilised for small places if it is pruned annually by cutting back any strong growth and reserving the medium young wood for flowers. It will bear the knife well in this way, so that the tree may be made to suit any place. Old plants may be severely cut back.

THE MAGNOLIA.

All the Magnolias will bear the knife, but I now chiefly refer to *M. Grandiflora*, a fine and popular variety, much grown in this country on walls. It is certainly a noble-foliaged species, producing grand

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flowers, but, except in the milder southern and western counties, only to a small degree. It requires to be thinned out and the wood well ripened in order to get these flowers.

The chief object in growing Magnolias should be to induce them to make a moderate growth annually after they have done flowering, and to form terminal buds similar to the Camellia. Annual pruning is necessary, cutting away old worn-out spray, and cutting back all plants generally, for the Magnolias are much inclined to make wood at the extremities like most other plants, and they will get barren of flowers below if not carefully pruned every season immediately after they have flowered. Thinning out, cutting back, and spurring in, and giving the plants some strong liquid manure at the same time, will induce a vigorous growth from the spurs, which will be terminated by a flower bud by the autumn. By these means they may be kept at a medium stature and well feathered with foliage below, with an abundance of flowers. Some are afraid to cut the Magnolia much, as others would be in the case of the Camellia; but I have cut it back severely, and with good results.

The Ailantus.

This beautiful pinnatifid leaf tree has but few allies, and of those not many are known; and although natural orders have but little to do with general appearances, yet it is often desirable that some idea should be given of a plant by a near neighbour or other person.

The *Ailantus*, or "Tree of Heaven," as some term it, on account of its lofty stature, is a fine and graceful tree. It is allied to the shrubby Trefoil (*Ptelea*); natural order, *Xanthoxylaceæ; Xanthoxylum*, the type; a *Dicœcious* plant. The *Ailantus* is a handsome deciduous lawn or near park tree, with beautiful light foliage. But little pruning is necessary for it; in its early stages, however, it will require some attention in order to form a really handsome specimen.

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The Rhododendron.

The Rhododendrons are seldom cut back except for layering purposes, when of course it is done annually as the layers are taken off. While young they may be severely cut back to form healthy dwarf plants, when they are growing in good peat land; but if they get old and are not growing in suitable soil severe pruning, with a view to obtain a new plant, will be all but futile.

It is true some of the common sorts may be severely cut back if on their own roots; but cutting back or pruning at all beyond regulating the growth of the plant in the case of the choice sorts which are grafted, and stopping them to form handsome specimens, will be even dangerous.

Standard Rhododendrons will require stopping while they are growing in the same way as the Azalea is managed, to induce symmetry of character. But whenever either the Rhododendron or the Azalea requires this it must be done as soon as it has made an inch or two of young growth, and not much afterwards, if flowers are to be expected in the next season. Sometimes a plant will grow contrary to the formation of a symmetrical plant. It will grow too much on one side, and not enough on the other. In such a case the knife must be used to cut out any unequal and fast growth, and to induce a uniform growth all over the plant. Symmetry in the character of the plant enhances its beauty quite as much as an abundance of flower, or even more so. I am sometimes disgusted when I see a good specimen spoilt through inequality of character, just for want of a little care in the early pruning and training. Some people are fearfully timid about cutting plants—even professionals are—but if they will but study their nature they will get out of that, and soon cut with judgment. It is seldom that we see good pruning either in regard to fruit trees or shrubs among ordinary gardeners, especially the jobbing hands. It is not always the gardener's fault, for ama-

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teur lady gardeners frequently overrule their better judgment.

Pure peat or decomposed leaf-mould, sand, and fine maiden loam of a sandy nature are absolutely necessary for growing the Rhododendron successfully. Pure peat is a natural compound of the three above-named materials, in which alone the Rhododendron, Azalea, Kalmia, Heath, &c., will grow well, and when they are planted in this natural compound they flourish differently from what they would in a soil less favourable; and in such soils more luxuriance of the species is the consequence. When this is the case pruning may be carried out with more confidence, because there will be no doubt about the plant benefiting by it; severe pruning even of old plants may be effected.

If Rhododendrons cannot be induced to grow freely, the flowering will not be so good, while, on the contrary, if they do grow freely, pruning may be resorted to, to form dwarf bushy plants, and to maintain an abundance of foliage near to the ground, which adds much to the real beauty of the species.

The Azalea.

There are two classes of the Azalea, one hardy and deciduous, the other less vigorous and evergreen. The hardy varieties generally come from America, and the greenhouse species from India, China, &c. In addition to the many varieties originally forming these classes, there are numerous garden hybrids which totally eclipse the originals in regard to colour and in the size of the flower, as well as in quality, many now being equal to some of the old semi-double Camellias, and as good, or even better, than some of the old Roses, to which some might be fairly compared. They are easy to grow, and no one possessing a greenhouse, or a space large enough to form a bed on the open lawn, where half-a-dozen or twelve plants can be planted, should be without them.

They require the same soil as the Rhododendron. All will bear the knife well, and a plant may be made

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to assume any character you please by pruning and training. If you wish for very dwarf specimens, cut them back; if dwarf standards, select a main centre shoot, and cut away all the others clean down to the crown of the plant, and train this up to whatever height you please. Then form the head by nipping out the points of all the leaders, and continue to do this as soon as three inches of young growth are made. Thus a clean stem, with a nice compact umbrella-shaped head, may be soon produced, forming a handsome plant. The same may be said of producing standards of either class. The advantage of standard and half-standard Azaleas is that, having two or three feet of clear stem, there is room under the head for other dwarf plants, thus giving variety and a protracted season of flower on the same space.

Old-established plants may be watered once or twice during the early growing season with liquid manure, but not after the terminal bud is formed. Old dwarf plants that have become poor may be cut down to the ground, with a view to reproduce new ones, so long as the root is healthy and the soil is good.

The Hibiscus.

These plants are among our most beautiful flowering shrubs. Many of them will compare with the Carnation, and are worthy of a place in every garden, whether it be large or small. The situation should be a warm one, and the soil of peat and good loam (top-spit soil from a good dry common or pasture), of equal parts, and good drainage, although they require an abundance of water while growing.

They may be pruned to any extent, to induce good, healthy, and compact plants. I refer here to the shrubby kinds, for this genus embraces annuals, perennials, and dwarf woody shrubs. They will flourish exceedingly about such places as Torquay.

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The Cistus.

This family comprises many useful and handsome plants. Nothing can be more beautiful or better suited for furnishing rockeries and for dry banks than the procumbent varieties of this tribe, varying, as they do, in colour, and forming very pretty objects on stone-work. Some of the erect-growing varieties are beautiful low shrubs, most conspicuous when in flower—for example, the *Gum Cistus*, which is well known on account of its large white flowers, conspicuously marked with rich patches of puce, giving it a remarkable and striking appearance.

The Cistus will bear pruning pretty severely, but I advise that the erect species be annually shortened at the leaders during its growth, which will have the effect of producing a more compact and uniform character than is generally seen. The procumbent varieties may be cut back to induce symmetry of character, and also to prevent barrenness in the foliage and flowers in the body of the plants. This pruning or cutting back severely should be done at one time, and that should be in the month of April or the beginning of May.

The Daphne.

There is no class of plants that can or does command more interest than the Daphne, excepting the Violet.

The Daphnes are durable as shrubs, and very ornamental and beautiful as flowers in the parterre, being also effective as perfumes. A good plant of *D. Mezereum* is sufficient to perfume a whole garden of a moderate size, and one plant of *D. Indica* will do the same for a whole conservatory.

Many of them are handsome evergreens, and fit for the select shrubbery. They are as a rule of slow growth, therefore a small amount of pruning is necessary. Some little cutting back will be needful with old plants, and nipping out the points of some of the plants when growing. The *Mezereum* and *D. Laureola* will

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bear the knife well, and may be cut quite back occasionally. *D. Indica* may be pruned moderately. It should be done immediately after flowering.

The Deutzia.

The *D. Gracilis* is well known, but the genus as a tribe is but little grown, although many of them are equally as handsome as *Gracilis*. This, however, happens to be a free-flowering dwarf shrub, useful for pots as an early forced flower; and a handsome variety it is, if pure white can be called handsome. *D. Corymbosa* is also a beautiful flowering variety, and it makes a most delightful standard lawn tree of three or four feet high when tied to a stake or iron rod. Nor can few flowering shrubs well compare with a nicely grown plant of this kind on a neat lawn when in full flower in the spring.

Good ground, consisting of a little peat and decayed manure mixed with the ordinary garden soil, and well prepared before planting, should be given these plants. Every season a good top-dressing of rotten manure should also be given these standard Deutzias, together with one soaking of liquid manure immediately after flowering, to induce a fair growth of young wood, on which will come the best flowers.

Pruning is likewise absolutely necessary with the Deutzias. These two principles must be maintained in growing them, viz. a free growth annually, and pruning out the old wood to be substituted by the new. This applies to the potted plants as well as the outdoor shrubs.

The Genista.

The Spanish Brooms are Genistas, but I now refer more particularly to the greenhouse varieties and to a dwarf section of this tribe. *G. Canariensis* is one of the best, if not the best, of the greenhouse varieties. This plant forms a most gorgeous pot plant when in flower in the early spring. It is one of those free-

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flowering evergreen shrubs that are necessary in every collection of plants to supply both sprigs of beautiful foliage and flowers at the same time for bouquet-making. This variety will never disappoint the grower of flowers, for the plant will flower whether it is large or small.

To obtain a fine, well-formed, and large specimen, frequent stopping of every leader through the growing season up till September must be resorted to, when the stopping may be discontinued till after the flowering is over. The plant may then be cut back freely to preserve compactness of form, and encouraged to grow, the stopping being continued; thus a beautiful specimen will soon be obtained.

All the Genistas require frequent or annual pruning. Even *G. Tinctoria flore-pleno* and the other procumbent varieties also require some annual pruning to preserve a healthy state of the plants. Cutting out old dead wood and the annual thinning of the plants are necessary in good gardening, in order to maintain healthy specimens, and for the further development of their character. What a miserable state of things do we generally see in shrub culture among amateur gardeners, except in the case of the few who keep good men as gardeners! The most beautiful plants pass unnoticed because they have no attraction through neglect of judicious pruning, which is the only way to bring about a good state of shrub culture, and the only thing to preserve it.

The Buddlea.

The *B. Globosa* is a general favourite on account of its pretty round balls of orange-coloured flowers, which are produced freely, but the plant has a wild growth with it which renders it unfavourable to some places; this, however, may be easily controlled by the knife. It is classed by some among "Herbaceous" plants, which is an error; for it is decidedly a woody shrub, and attains to the height of five or six feet.

If this plant is annually cut back in the early spring,

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say in March or April, according to the season, the species may be made subservient to any circumstances. It will bear any amount of cutting back, so that it may be made to suit the place, whether it be large or small; and a more beautiful flowering dwarf shrub could scarcely be had when it is in bloom, showing as it does its perfectly round balls of bright orange flowers above the foliage.

The Ribes.

The *Ribes Sanguineum* is the only one of this genus worth possessing. Its treatment as regards soil and pruning may be the same as that of the Black Currant, but as it is not a fruit it is used as a flowering deciduous shrub. This unfortunate plant is mostly treated in the same way as many other beautiful shrubs, *i.e.* merely planted among a number of others that overcrowd and starve it; and you may see it pushing a small limb or a few twigs through some shrubs that do not flower with much effect, or not at all, which seem almost to say to the poor *Ribes Sanguineum*, "Keep back, I am jealous of you." If those who possess such a shrub would but plant it in good ground, and fairly prune it annually as I have directed for the Black Currant, and give it some open conspicuous spot, I can vouch for a splendid spring display of its racemes of red flowers, which at a distance might be taken for pendants of coral.

Old plants may be renovated by completely cutting them back, which will produce a new tree. The flowers come on the preceding year's growth.

The Hydrangea.

To succeed with the Hydrangea, one part metallic peat and one part maiden loam are required. By "metallic peat" I mean peat containing minerals, such as iron, tin, &c. This kind of soil will produce the beautiful blue colour, so much coveted in some parts, in connection with this flower.

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Some profess to distinguish the blue as a distinct variety, but I have proved it to be otherwise. The common pink-flowered kind will produce the blue under these circumstances, and go back again the following year by planting it in other soils; and if the reader purchases a blue Hydrangea in flower, it will produce pink ones the next season unless it is shifted into fresh metallic peat.

The *Hydrangea* is no doubt one of our best hardy border plants, and should have a bed among flowering shrubs in every well-devised garden. The pruning of it consists in cutting the previous year's growth back to within a few inches of the ground, and then to top-dress the bed with decayed stable manure.

The Myrtle.

The Myrtle is too well known to require any description here, but in some parts of England no idea can be formed of what it does in the western counties. About Torquay the Myrtle is grown as a common lawn shrub, where it attains to the height of eight or nine feet.

It requires some annual pruning to prevent it from getting barren of foliage below. In the month of March or April, according to the season, go over the plants and cut back all the main leaders; this will promote a young and healthy growth below. Old and overgrown plants may be severely cut back to any extent with a view to obtaining new plants. No one need be timid about cutting back the Myrtle, for it will bear it well.

The Coronilla.

The *Coronillas* are not to be seen growing as shubbery plants in some parts of the country, but in Devonshire they are common border shrubs. *C. Glauca* grows to a good-sized medium shrub at Torquay. It is a plant that requires some little annual cutting back to keep it compact and symmetrical. It makes a handsome shrub on the lawn as a single specimen, flowering

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as it does abundantly, as well as being luxuriant in foliage.

The Fabiana.

The *F. Imbricata* is reckoned amongst our half-hardy shrubs, but it is quite a hardy one in the West of England, and grows to a moderate-sized dwarf shrub. It is a very pretty Heath-like evergreen, bearing an abundance of white flowers. It prefers a dry soil, consisting of loam and peat, and requires similar management to a hard-wooded Heath, although it does not belong to that tribe. By nipping out the points of the leaders a dwarf and handsome compact plant may be obtained. It may be cut pretty severely, with a view to renovate an old deteriorated plant. The stopping should be done after flowering.

The Kalmia.

The Kalmias are peat-loving plants, nor can they be grown well without it. They are no doubt the most exquisitely formed flowers we have among our hardy shrubs. They are not particular as to situation, but suitable soil must be provided for them, or failure will certainly ensue.

They will do well in a group with the Azalea, although the Kalmia is of slower growth than that plant. They may also be planted on the outside of the bed when grouped with the Azaleas.

Very little pruning is required for the Kalmia. In the early stages of its growth some stopping of the leaders may be necessary to form a symmetrical and bushy plant, well feathered below with foliage. This stopping should be done as soon as two or three inches of new growth have been made.

The Andromeda.

This is a genus of very pretty shrubs, while some are trees belonging to the natural order of Heaths, although

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not much like them in their general appearance. But as all natural orders are founded upon structural affinity, the Andromeda resembles the Heath in the flower, though not in the foliage. The strong-growing kinds need cutting back to induce compactness of habit and uniformity of growth, such as *Floribunda*, a general favourite, which merely requires stopping the leading shoots to form a handsome dwarf plant. It delights in peat soil and is an abundant flowerer, well worthy of a small bed in the parterre, or as a front row round a Rhododendron or an Azalea bed. Old Andromeda plants may be cut back when they require to be renovated.

The Lavender.

The Lavender is a general favourite, and is much cultivated for an essence made from it. It is also used for perfuming ladies' wardrobes, &c., the flowers being dried for that purpose. It will grow in almost any kind of soil, but delights most in good light ground.

The Lavender requires to be cut back every season, in order to keep the plants of a dwarf character and well feathered with foliage below. Severe cutting is never necessary except in cases of old, overgrown, and neglected plants; merely cutting back a few inches in the month of March is all that is required to preserve compactness of character in the plant, and to insure a vigorous growth, so that it will produce a fine bloom.

Plants raised from seed are more productive of flowers than those grown from slips or cuttings. The first and second seasons after they are raised the seedlings should be cut pretty close back to induce a dwarf and bushy habit. The plants may be cut back after the flowering is over if previously omitted, for late pruning of the lavender will not do for the flowers.

The Spiræa.

The Spiræas are a beautiful class of plants, very little grown, except the *Japonica* and one or two more; but

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as a tribe they are well worthy of a place in every select shrubbery, or as detached plants in the parterre, especially *S. Ariæfolia* and *Lindleyana*. There is no class of flowering shrubs that is more beautiful than many of these.

The shrubby kinds require some annual pruning in the month of March to regulate the growth and to keep them of a compact character. Cutting back annually should be done to obtain this object, and handsome and healthy plants will be the result. The young wood should not be cut off, but left on, merely cutting back the older branches, or shortening in, as it is called.

The Heath.

The Heaths require pruning annually to induce a handsome growth. The soft-wooded sorts must be pinched back while the young growth is being made, and some careful pruning must also be done; but if a plant gets old and barren of foliage below, it will not bear cutting back into the old wood, for if it is thus pruned with a view to renovate it, nothing but disappointment will be the result. None of the Heaths will bear such severe pruning, and they will not break into good growth from the old wood.

All classes of Heaths must be carefully pruned while they are young, or, at least, no severe pruning must be done upon old ones at any time, nor with any class. As soon as they have done flowering, whether they are either indoor or hardy sorts, they should be pruned by carefully cutting them back only so far as to leave a good stock of young stuff on the plant. Hardy Heaths should be cut in, so as to maintain a compact and symmetrical plant. The autumn-flowering sorts may be done in the spring, and the spring sorts immediately after flowering.

The Thyme.

Some may think it a very small matter to write about pruning, or to include the Thyme in a work on

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this subject. But from many years' observation of this common and popular plant, I see the greater reason for the remarks concerning it, than upon most of the others. Nineteen out of every twenty who grow this herb seldom treat it properly as to cutting it in; the consequence is that they generally lose the plants after one or two years.

Thyme, as a pot-herb or as an edging to flower beds, can never be preserved in a healthy and permanent condition without due attention to the *proper time* for cutting it back. I now refer more particularly to the erect-growing sorts. The Thyme plants should be all cut back not later than the middle of August, cutting them down pretty close to the ground; if in single plants or in beds, take hold of each with the hand, gathering up the entire plant (if not too large for one handful), and holding it quite tight, then with a sharp pruning knife cut the whole of the top off evenly to within three or four inches of the ground—three inches are enough as a rule—then move the surface of the ground a little and give a little top-dressing, and by the winter the plants will be well clothed again with an abundant young growth ready for use. They will not then suffer from frosts, as they do when cut back later; and if not cut back at all they exhaust themselves, get deficient of young stuffing Thyme, and ultimately die.

As an edging the upright kinds may be clipped with the shears, as is done with Box edgings, not later than the time named above.

The Golden Thyme, when grown as an edging, must be cut into a state of neatness and compactness by line for a straight edge, and with the edging knife or a pruning knife if otherwise planted. But the annual cutting back must not be neglected in either case if you wish to preserve Thyme in good and permanent order.

The Sage and Savory.

Each of the above pot-herbs requires annual pruning or cutting back. Sage, as a rule, is best when used in

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a green state; therefore it must not be cut back before the spring, say in April or May. The Savory (Winter Savory) may be treated in the same way as the Thyme. The Sage should be cut back, and then some manure forked in. *Rosemary* and other shrubby herbs may be done in the same manner.

The Pruning and Cutting Back of the Box-tree.

The Box is a very ornamental class of trees. They are generally clipped with the shears, and this may be done without much disadvantage to the beauty of the plants, but, as a rule, some sorts are by this method divested of that peculiar feature which is so striking in most of the varieties. The variegated kinds, especially *Variegata pendula*, would be literally spoilt if clipped with shears, and so would *Balearica;* but the small-leaved green varieties may be clipped.

The ones named should be carefully cut over with the knife, as by this method the leaves are preserved intact, in which consists the beauty of all flowerless shrubs. The pendulous sorts can never be clipped without a serious loss. The kinds that may be clipped, as well as Box edging, should be done not later than June—about the third week in the month; then they will have time to get sufficient new growth to protect the parts exposed by the clipping. If it is done later there is the risk of the edgings or plant being exposed to frosts, and being materially injured, if not killed by them. I know of an instance of this at the present time. Some Box edgings being clipped too late, the frosts have injured them considerably, and they look very bad, as though they had been scorched by fire.

So many of these mistakes occur in pruning, clipping, and cutting back the Box-tree, or through not doing it at all, that I have been induced to make these remarks on the matter.

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PART IV.

THE PRUNING AND RENOVATION OF HARDY CLIMBERS.

The Ivy.

The Ivy as a genus is both useful and beautiful. I need not attempt any description of it, for other writers have done that well—Mr. Shirley Hibberd, for instance, who has, I believe, done ample justice to this tribe, although I have not seen the work in which he treats of it. Suffice it to say that the Ivy is a peculiar and wonderful plant. A lady I knew very well had it trained on the walls of her sitting-room, where it seemed to thrive; and I have known old houses covered so thickly with it that no water or damp could get at the outer walls, which would no doubt have admitted a great deal of water during heavy rains had it not been there.

The pruning or clipping of the Ivy is an essential thing to its well-being as well as to its beauty. There is a sort that will do without much of this, viz. the small-leaved *Helix*, or common British Ivy, a beautiful, close-growing, cut-leaved variety; but the Irish Ivy, a kind commonly met with, requires an annual clipping if grown on houses or walls. Knife-pruning is necessary in cases where the Ivy is grown as an ornament on arbours, old trees, fences, &c., but where on walls or buildings it should be annually clipped close, the month of June being the proper time to do it, when

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there will be time for it to make new foliage (which is very beautiful) before the winter.

All pruning should be done to every variety of the Ivy at the same time, then no loss will be incurred. It is necessary to cut back and clip Ivies annually, to keep them in good order, for most of them will run into growth at the extremities and get barren below if left unclipped or unpruned.

THE HONEYSUCKLE.

Any lengthened description of the Honeysuckle is almost useless, as it is pretty generally known and appreciated by everybody. The uses of this tribe are of one kind as a rule, and that is as climbers and twiners. Twiners they are in the true sense of the term. I have no doubt but that most people have at some time or other observed how completely and strangely the common Woodbine will twine itself round a rod of growing Birch or Oak, and nearly bury itself in the rod, by the non-elasticity of the Woodbine and the rod of Birch, &c., continuing to grow until a perfect thread is formed on the rod. This shows the strength of the longitudinal fibre of the Honeysuckle. The Honeysuckle flourishes and flowers best in a warm and dry soil.

The pruning of it is a matter which has elicited many inquiries, some of which have recently come under my own notice in the various journals. The Honeysuckle gives out its flowers upon the short laterals produced upon the well-ripened young wood of the preceding summer's growth; consequently the pruning must consist of shortening to a moderate extent the last year's wood, and in no case must the preceding year's wood be cut back severely.

Again, after the laterals have borne flowers they may be spurred back to an eye or two for a second crop of flowers, which they will produce in the following year if they are strong, but if not these leaders should be cut clean out and new ones substituted for them, which is the best plan.

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There is a similarity between the pruning of the Honeysuckle for a crop of flowers and that of the Grape Vine for a crop of fruit. The well-ripened leaders of each produce the best results as a rule, but strong laterals spurred back will also do well.

When the Honeysuckle is grown as a bush in a pot, it is necessary merely to cut out some of the leaders, and then to train the well-ripened young ones round five or six sticks or on a globe trellis, but not to cut the whole of the last season's growth back to a long spur. This is the reason why so many people fail to get flowers.

The Virginian Creeper.

The Virginian Creeper is largely cultivated to cover walls where little else will grow. This creeper will thrive in close and confined places, such as are to be found in our towns and cities. It is remarkable for the peculiar change in the colour of its foliage in the autumn, which makes it very desirable as a decorative creeper. But little pruning is necessary, and this consists in cutting back some of the old leaders, thinning out, and spurring in, similar to the pruning of the Vine. It should be done late in the autumn or in the early spring.

The Clematis.

There is no class of hardy climbers so beautiful as the various tribes of the Clematis, diversified as they are in character and colour. Of late years this family has advanced amazingly as regards the character of its flowers.

They are a most accommodating class of climbers, being well suited to both the indoor and outdoor decoration of walls, trellises, &c., while for permanent beds nothing can well equal most of them. Even the common "Traveller's Joy" is one of the most remarkable and beautiful hardy climbers one can possess. I have often noticed the beauty of this old English plant as it

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grows on the hedges by the wayside. The development of the stamens of the flower and its permanent character, together with the beautiful cotton-like feature connected with it, render it most conspicuous and well worthy of notice as almost a curiosity among plants. These feathery and persistent flowers may be cut from the plant when they are just beginning to develop, carried home, and placed in a vase without water or anything else, and they will continue to develop themselves for many days—in fact, until they have perfected all their fine feathery parts in a most beautiful and delicate manner. They may then be dyed all sorts of colours, when they will make charming ornaments for vases for many months.

The Clematis produces its flowers on the current year's wood—that is, the plant makes the growth on which the flowers come at one and the same time. All the ripened wood produces young growth at the joints on which come the flowers. Therefore, when the Clematis is pruned, cut it back to some well-ripened last year's growth containing live buds. The time for pruning is from February until May for the outdoor kinds; but for the indoor varieties, such as *Sieboldii* (a most beautiful greenhouse sort), *Indivisa*, &c., it may be done at any time during the winter, or as soon as the flowering is over. But for the hardy outdoor sorts it is not safe in some counties—*e.g.* for the northern counties—to prune till after the danger of frost is over, as sometimes severe and protracted frosts will kill them.

THE JASMINE.

The *J. Officinale* is the most popular of this tribe, nor is there one of all the genus better suited for a climber or for pot culture. It requires a south wall and a warm and dry soil. In the western counties about Torquay it flowers profusely, and grows to a large size on the south walls. It will be observed that the Jasmine bears its flowers on the young wood of the current

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year; that is, that which springs from the eyes or cut-back spurs of the old wood.

In the first instance, lay in the principal leaders as is done with a Rose trained on the wall. Then adopt these leaders as permanent bases for the future supply of laterals; each of the buds on these leaders will emit a lateral, and these will give flowers. Every season after the flowering is over, and at any time from November until March, cut these laterals back to one or two buds on the leader, *i.e.* spur them in as you would a Grape Vine.

Old leaders that are worn out, as well as weak ones, may be cut clean out, and new ones substituted for them. Frequently the old leaders will want shortening in to prevent the plant from getting barren below.

The Passion-flower.

As a rule Passion-flowers get the mastery of the gardener. It is a rare thing indeed to find the common *P. Cærulea* kept in good order—it is generally a mass of confusion. The reason is that this magnificent climber makes such rapid growth that it gets into a confused state before the manager is aware of it. The Passion-flower, and the person in whose care it is, remind one of the boy who was sent by the farmer into one of his fields to spread a lot of manure heaps over it. The boy idled away his time, and thought to himself that he could do the lot in one quarter of the time allowed him for the job, and so kept delaying and delaying until he found night coming on fast, when he gave it up and said it could not be done at all. Just so is it sometimes with the Passion-flower. Many, no doubt, think and say, "When I have done so and so, I will see to that Passion-flower on the verandah;" but a week is soon gone, and in the meantime it gets in such a confused state that it cannot be disentangled without a serious injury to the young and tender growth.

It must be observed that the Passion-flower produces

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its flowers upon the current year's wood, *i.e.* it makes some considerable growth before they appear on the wood of the same season.

The proper treatment of it, as regards pruning, consists in first laying in permanent leaders, which should not be thicker or closer together than those of a Grape Vine. This is where most persons make mistakes: too many leaders are laid in, one permanent leader being enough to cover two feet on each side of it with laterals. At any time from February until April these laterals may be cut back, as in the case of the Grape Vine. And here I would just remind the reader, that the cutting back must never be omitted for a single season, for if it is, disorder and a loss of neatness will ensue, and, besides this, there will be no display of its curious and beautiful flowers. It must be carefully and constantly pruned once a year, and the laterals neatly laid in, if a really good display of flowers is to be expected.

The Wistaria.

There is no hardy climber more beautiful, nor one better suited for arches, pillars, and festoon work, than this plant. It grows very rapidly, and makes rods of ten or twelve feet in length in one season, and these rods are so flexible that they may be twined and trained at pleasure. The flowers are produced upon the last year's wood, consequently the pruning is quite different from that of the Passion-flower. Although long spurring must be adopted on old leaders year by year, yet the finest flowers, as well as the greatest number of them, are obtained from the last year's growth well ripened as in the cultivation of the Vine. To insure a fine display of flowers, lay in as much of the well-ripened wood as possible. The pruning of this plant may be done from November till March, but not much after.

The Bignonia.

The Bignonia, or *Tecoma*—for the division of this genus is not outwardly different, although there is some

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difference in the internal construction of the seed vessel —is one both of grandeur and beauty. As a tribe they constitute plants fit for outdoor and indoor ornamentation, being of comparatively easy management; but, in spite of this, we seldom find them grown in our conservatories. *B. Alba* is a splendid conservatory sweet-scented plant. *B. Grandifolia* is another good climber, and grows rapidly, its flowers being of an orange and purple colour blended together. Then there is *B. Radicans*, sufficiently hardy to stand out of doors on a south wall.

These are magnificent specimens with their grand trumpet-shaped flowers of a large size, varying in colour from white to crimson. These flowers are produced upon the current season's wood, similar to those of the Grape Vine, the treatment of which as to the pruning will serve for an example.

The Climbing Bignonias should, in the first instance, have permanent leaders laid in as for the Vine, then these will give laterals on which come the flowers; and when the flowering season is over these laterals may be cut back to spurs. Care should be taken that the wood is well ripened, or but few or no flowers will be the result. Some thinning out will be necessary during the growing season to let the sun get at the young wood in order to ripen it thoroughly.

The Tacsonia.

The *Tacsonias* are a genus of the *Passiflora*, or a division of that genus. The flowers, which are produced on long pendulous footstalks, are showy and somewhat remarkable. The *Tacsonias* are conservatory plants of a quick growth and moderately free in the flower. The pruning may be assimilated to that of the Passion-flower.

The Aristolochia.

These are a genus of noble and beautiful-foliaged climbers, with curious, but, as a rule, insignificant

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flowers. No one should get this climber with a view to the flowers; but for grandeur of foliage there are few things to match it.

It is necessary to prune them by cutting back as for the Vine, and in order to obtain abundant foliage if to cover a wall. They are much liable to insect pests.

The Rubus, or Double-flowering Bramble.

This is a climber but little grown or known, but still it is a good one. The foliage is like that of the common Bramble, but I think of a deeper and richer green. The flowers are similar to those of the finest Blackberry, but as double as a Rose; it is a beautiful thing when in flower. It requires a south or south-west wall, good soil, and to be pruned annually, cutting into spurs—not too close, however.

The best time to prune them is in March or April. There are a great many varieties of this tribe, but I more particularly refer to *R. Bellidiflorus*. There is a very pretty double pink-flowered variety, *Flore-roseo pleno*.

The Solanum.

There are a great number of this family, some being adapted to compact pot culture, and others for training on walls. However, I here refer to *Jasminifolium*, *Giganteum*, and *Arboreum*. These are usually classed with greenhouse plants, but in the West of England *Giganteum* and *Arboreum* do well on walls out of doors. *Giganteum* is a fine-foliaged climber, producing clusters of beautiful light blue flowers, making it a most desirable plant to cover trellises and walls; it will grow many feet in a single season.

The pruning of this plant consists in cutting back to spurs annually from February until April, or the old rods may be cut clean out and the last year's young wood laid in, from which an abundance of flowers will come. Some will require cutting quite down, in which case young stuff will come up; others require cutting quite back early in the spring, to induce an entirely

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new growth, on which will come berries, but this applies to the fruiting kinds. The kinds named above grow fast, and are showy things for covering walls, arches, pillars, &c.

The Pyrus Japonica.

This can scarcely be called a climber, yet it is an excellent plant for training on low walls, trellises, &c. There is no necessity for me to describe it, as almost every one is acquainted with it. It is a very handsome as well as one of the hardiest and earliest flowering plants we possess. In spite of the cold it will flower in February and March, and before the leaves appear. There is nothing more striking than a *Pyrus Japonica* in full bloom on a south or south-east wall in the months of February or March, with its gorgeous scarlet flowers. It will grow in any good common garden soil, but it requires some annual pruning in a similar way to that adopted with the Pear or Plum; that is, spurring in, and laying in the young wood which bears the flowers.

To preserve a neat, orderly, and scientific appearance in the plant, it is necessary to prune it and train it handsomely, just as a gardener would do in the case of a Plum-tree bearing fruit. I am of opinion that the beauty of a trained tree is considerably enhanced by the training being done in a neat and scientific manner, let the plant be what it may.

In the first instance the *Pyrus Japonica* should be laid out on the wall or fence in a similar way to which a Peach would be done by a good gardener, and preserved on the same principle year by year. Old and barren plants may be cut quite back in order to induce the formation of a new tree. (See the "Pear," "Plum," "Peach," &c.)

The Pyracantha.

This is one of the evergreen Thorns, and though not a climber it may be trained to cover a high wall.

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It will carry foliage from the lowest parts of the plant for many years, and maintain an equal distribution of the growth and leaf from its lowest parts up to the top, although it may be from twelve to fifteen feet in height. It is not a fast grower, but possesses a most tenacious power of endurance; no weather seems to affect it.

It is very striking in its appearance when in berry, which it bears in large clusters. These continue on the plant for many months, contrasting in a remarkable way with the foliage, which is of an intensely dark green, the berries being of a vermilion colour. It is a very desirable plant for walls where continued neatness and an evergreen covering are the objects in view, let the situation be what it may.

The pruning consists in merely an annual cutting off of foreright growth, *i.e.* the little growth it will make direct from the wall, and a laying in of the leaders and sub-leaders. Old plants may be renovated by cutting them back severely, and then strong young wood will be made in the following season.

The Calampelis Scabra.

This is the *Eccremocarpus* of some, and is a tribe belonging to the *Bignonias*. The flowers are small, but beautiful and of great substance. The plant bears its flowers in immense clusters, and continues to do so all through the summer in places favourable to its growth. It is a most rapid climber, and will grow to the height of ten or twelve feet during one season if the plant is strong at the root. It requires particular attention in pruning and training during the growing season, for if neglected for only a week or two the confusion of the tender growth will be irremediable.

Some thinning out of the young growth and careful training in of the remaining leaders and laterals cannot be dispensed with, without a great loss of beauty and good order in this climber. Young plants generally die down to the ground in the late autumn and

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shoot up again in the spring, but in such cases some winter protection of the roots will be necessary. Cover them with a straw mat tilted so as to throw off the heavy rains. Old and woody plants may be trimmed by taking off all the sappy stuff. It is best to have a slight protection during frosts, but in the West of England the *Calampelis* will generally stand out all through the winter quite unprotected.

The Cobœa Scandens.

This is a most rapid and noble climber, and may be used for outdoor purposes in summer; but as a rule it is only fit for cool conservatory decoration. The plant is a fine one as regards its foliage, and the flowers are like a bell in shape, being of a rosy purple colour. It flowers freely when the plant gets two or three years old. The *Cobœa* will live for many years, and thrive and flower abundantly. I knew of a plant that had a stem—the main one—as large as a man's thumb, and it was then splendidly in flower.

This plant may be raised from seed or by cuttings, and the pruning of it consists in cutting back the last season's growth to a joint on the main leaders. This should be done in the spring, from February until April, but not in the autumn nor in the dead of winter.

The Ceanothus.

C. Azureus, or *C. Cæruleus,* is generally considered of a half-hardy nature; but it grows splendidly on open walls in the West of England. It is a most beautiful plant for compactly covering the walls of a house. All the pruning required is to cut out any superfluous parts and to thickly train in the young growth.

The Kennedya.

These are all more or less beautiful greenhouse climbers, having pea-shaped flowers. Some are poor

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in colour; but *K. Lindleyana* and *Makoyana* are beautiful purple-flowered varieties. However, some of the reds are, in my estimation, of too dirty a colour. The blue and white flowered kinds are beautiful ornaments for the conservatory, and may be grown in pots, trained on globular trellises, or up the pillars, or on the back of the house. In any case due attention must be paid to the thinning out and keeping the plants open, so as to get all the air and sunshine possible into them, in order to ripen the wood. They flower on the laterals which spring from well-ripened wood. The pruning consists of shortening in these laterals every autumn, in order to obtain good flowers the ensuing season.

The Stephanotis.

This is a very limited genus, containing but one or two varieties, *S. Floribunda* being the only one worth growing; although I believe there are two varieties of this, one of them being a shy flowerer. It is a stone climber, with thick leathery ovate leaves something like those of the Laurel, though not so large. It is a great favourite with those persons who cultivate cut flowers.

The flowers are white, and are produced freely upon the well-ripened wood; that is, if the growth is well ripened during the previous season, it will produce laterals which will give an abundance of flowers.

The pruning consists in cutting away the worn-out wood, and training in the well-ripened young wood, carefully thinning out the whole plant so as to admit a full share of the sunshine and plenty of light, or no flowers must be looked for. The time for pruning is as soon as the wood is thoroughly ripened, which is generally in the autumn. It is useless trying to grow the *Stephanotis* for flowers in a dark, shady, or dirty house, or one not dry and warm. Neither must it be grown where trees shade the house, as is sometimes the case. Sunshine, good light, and a warm, healthy climate are indispensable for growing the *Stephanotis*

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successfully, for it must be remembered that it comes from the East Indies, where Melons will grow among the stones in the streets.

The Abutilon.

This is a most beautiful class of fast-growing plants, being neither climbers nor twiners, but they may be utilised as such in various places. At the back of a conservatory the *Abutilon* is quite at home. It is most ample in its foliage, this being of a fine feature also. It flowers freely on all the young wood. Age is necessary for an abundance of these when it is grown as a pot plant.

In pruning the *Abutilon* spur in the laterals to a few buds, or cut out old limbs and lay in moderately well-ripened young wood. This may be done annually at any time in the autumn, or if the plant is out of doors prune it in the spring.

The Sollya.

This is a small family of very pretty dwarf, blue-flowered climbers, fit for training on the back trellis of a conservatory or up the pillars of it. In the first instance induce the plants to grow strong, and then select one or two of the main leaders to twine round the pillar. Prune all the laterals produced on these to a few buds on each spur, and continue to do so annually. Do the same also by a plant trained on a trellis on the back of the house or elsewhere. By this method of treatment an abundance of the pretty little blue, salver-shaped flowers will be produced, forming quite a display for many weeks, and, indeed, for most of the summer.

The Plumbago Capensis.

This is not, strictly speaking, a climber, but it may still be utilised as one for conservatory decoration, and is a most beautiful thing when trained in that way.

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Some put this plant down as growing two feet or so; but I have found it difficult to keep it so dwarfed. Even in a pot it will grow three feet easily; but if it is planted in a compost of equal parts of maiden loam and good peat, at the foot of a pillar or the conservatory wall, it may be trained to almost any reasonable height by degrees, by growing it freely and inducing it to give laterals, which will produce the flowers.

It is a woody-growing plant, and if well managed by shortening the laterals moderately after the flowering is over, it will continue for years as a good ornament for a conservatory, making a fine display of its beautiful light blue heads of flower, which will continue for a long time. It is the best of this genus, and is not difficult to grow.

The Ipomœa Learii, Etc.

I. Learii, reddish purple; *I. Horsfalliæ*, rosy purple; both of which are rapid-growing climbers fit for the roofs of conservatories. They are generally classed as stove plants, but I have grown *Learii* in a common greenhouse. They should be trained a foot or more from the glass, where they will make a most splendid display. It is necessary to keep them constantly cut back, as they run to growth towards the extremities.

The Escallonia Macrantha.

This is not really a climber, but a fast-growing plant that may be advantageously utilised as one. I have written on this in another part of this work, treating it as a shrub; but as a beautiful evergreen flowering plant for nailing on walls or training on trellis-work it has no equal.

It is necessary to train out the leaders first, and then to lay in the laterals, filling up the spaces between them so as to completely cover the wall or trellis, which it is easy to do. It will be necessary in the spring of every year, in the month of March or April,

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to shorten these laterals by cutting them in moderately close. Then a new annual growth will be made, producing an abundance of flowers throughout the summer. I cannot convey any adequate idea to the reader of the beauty and richness of a well-managed *Escallonia Macrantha* trained thus on a wall, facing the south or south-west, if he should happen to have no knowledge of this plant.

The Lapageria.

There are at present but two varieties of this beautiful climber—one a rose-coloured flower and the other a pure white. Both of these are admirable plants for trellis-work in the conservatory. They grow freely and flower profusely. The flowers are bell-shaped, and are suspended from the laterals in a beautiful manner, hanging below the foliage.

This plant should be trained so as to give the flowers the advantage of a free suspension, and the kind of trellis on which to train it should, no doubt, be one of a cylindrical shape, having tiers on tiers of wire, each one sufficiently far apart to admit of the flowers swinging clear of the one underneath; and they should also be trained all round. The flowers are produced on the long laterals, which must be tied to the leader. The pruning consists in cutting these laterals back after the flowering is over.

The Habrothamnus.

These are an extraordinary kind of flowering greenhouse plants, *H. Fasciculatus* being one of the most profuse in that respect. The flowers are of a crimson colour, and grow in immense clusters on the ends of the laterals. The pruning consists in an annual cutting-in after the flowering is over, shortening in those laterals and cutting back the old growth, so as to induce a new growth throughout the whole plant.

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The Hoya.

This is a stove climber of moderate growth. It likes warmth, but it may be grown in a good warm greenhouse and trained on a wire on the back wall. It is a very rich-foliaged plant, which it carries continuously for years. It may be kept in good order with very little trouble, although some slight pruning will be necessary to keep the plant back.

The Cotoneaster.

C. microphylla is the one generally grown, and is a useful plant for covering low walls and fences. It is so hardy that neither situation nor climate will affect it. A little thinning out and an occasional cutting out may be necessary. When it is grafted on stems, as is often done, for lawn trees, some free growth and thinning out will be needed.

Finally, as regards this part of the subject, all creepers and climbers, whether of a hardy or tender nature, which flower upon the current year's growth, laterals, &c., should be pruned annually, as is usual with the Grape Vine—cutting back the laterals to within a few buds of their base, but, as a rule, not too close. I want the young gardener, and also the amateur lady and gentleman gardener, to observe this rule as a safe guide in pruning climbers in general. Of course leaders are to be laid in as an extension in all cases.

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PART V.

THE PRUNING AND RENOVATION OF POT PLANTS AND SHRUBS.

The Epacris.

These are very similar to the Heath, but more hardy, by which I mean that as greenhouse plants they will endure rougher usage than the greenhouse Heaths. The *Epacrises* are a fast-growing class which soon form large specimens from small plants. Generally they may be grown with a miscellaneous collection of greenhouse plants, and are of great use as cut flowers from the autumn till late in the spring.

As soon as the flowering is over the plants should be cut back moderately and stimulated into active growth, and when two or three inches of new growth are made nip out the top of each shoot; this will induce several laterals to push out from each leader so stopped. These laterals may be stopped as soon as they are two inches long. The nipping out of the points of these young shoots may be repeated three or four times, but not carried too far, or else no flowers will be produced. Judging from the time the variety comes into flower, a certain period must be allowed for it to make six or twelve inches of growth from the last stopping, and to mature that growth; for instance, if it is an autumn-flowering sort, the nipping out of the points of last-made laterals must be discontinued in June or July at the latest, and the growth stimulated by means of a moderate heat and some liquid manure,

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and when from six to ten inches of good growth are made the plants may be exposed to a full share of sunshine in a good house not shaded, plenty of air being admitted daily to ripen and harden the new parts. Thus it will be seen that three or four months should be allowed for the new growth to develop itself and to ripen from the last stopping of the laterals.

The Camellia.

Generally Camellias are considered to be impatient of the knife; hence we find them with stems six or eight feet high without a single branch, whilst growers of them have to build the houses high, and to continue raising the same building according to the demand of the plants. This, however, may be avoided by pruning, but of course a little sacrifice of flower for one year is necessary, and this is not felt where there is a large stock of plants, or it may be even only a few. I once had some Camellias that were getting barren below. I cut some of them back severely, in fact to mere stumps, put them into a nice heat, gave stimulants, and they broke out strong, and made finer and healthier plants than some which I did not cut back. It would not be safe to allow Camellias to run up to ten feet with a clean stem, and then to cut them down to the ground, but I maintain that they may be kept dwarf by cutting them back before they get to such a state of growth.

The proper time to prune the Camellia is in the spring, after the flowering is over; some, in fact most people, are afraid to cut them at all, but let me give such persons confidence by assuring them that what I say is not mere theory, but the result of practical experience. Do not be afraid to cut back overgrown Camellias. As soon as they are cut back give them a few weeks' moist heat, *i.e.* close the house and syringe the plants every morning, and continue them in a growing state till the terminal buds are formed, then harden off a little and set them out of doors if in pots, but if in the beds of the house open the lights all round day and night until

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November. Old Camellias may be renovated by severely cutting back, almost to mere stumps.

The Oleander.

The *Oleander* is an old favourite and of a very enduring constitution. It will live and grow under all kinds of treatment, but it requires an abundance of water and some heat in order to produce good flowers. There are few flowering shrubs more beautiful than the *Oleander*, and I scarcely need describe it, as it is so well known; suffice it to say, then, that the flowers are of a red, white, or pink colour, and are comparable to some Roses, the single kind being similar to a self-grown Carnation.

These plants flower in clusters, which are extremely beautiful. They require some annual pruning by severely cutting back the leading shoots and reserving the lower laterals. This should be done immediately after the flowering is over, which is about June, July, or August, according to treatment. After the plant is cut back shift it, give an abundance of water, and subject it to a moist heat of 65° or 70° Fahr. to induce a fresh growth, and when this is well developed discontinue the heat for a few months till the flowering comes on again. The *Oleander* will bear any amount of cutting back.

The Acacia.

The greenhouse Acacias are both numerous and beautiful ornamental shrubs, many of them being splendid-foliaged plants, *A. Lophantha* being among the best. This class requires annual pruning to prevent it getting beyond what is desirable. It is of a very free growth and soon gets large. Nipping out the points of the young shoots as the plant proceeds in growth is necessary from the first stages of its growth as a young plant, and to keep it dwarf it should be frequently cut back. It will bear the knife well.

The pruning should be done in the early spring, so as

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to allow of new growth being made and matured or fully developed before the winter. Plenty of water must be given the plant during the summer. This is one of our best window plants.

A. Armata is a very handsome dwarf shrub, and one which is well known. The pruning of this evergreen shrub consists in the occasional cutting back of old and large plants, and no one need be afraid to cut them back severely. This should be done immediately after the flowering, and the plant should be stimulated afterwards by means of some weak liquid manure, being kept in the greenhouse till six inches of new growth are made, when it may be set out of doors under a north wall for a few weeks until there is no danger of frost. Young plants should be stopped in the leaders by frequently nipping out the points, which will induce a compact and handsome growth.

THE CHOROZEMA.

There are several varieties of this beautiful flowering greenhouse shrub, all of them being fit for fine specimens in any good common greenhouse. They are not difficult to grow, as they do not actually require a high temperature. In fact, they will not bear it. No more handsome plants are grown than these when in full flower. To form fine and symmetrical plants of the *Chorozema*, early and frequent stopping of the leaders must be done while they are young, to induce them to branch out equally all round. It is the formation of the future specimen in the young plant that is of the greatest importance.

Grow the Chorozema as fast as you can, and stop the leaders as often as they have made two or three inches of new wood. Old and large plants that have been neglected and have got out of order, but are still healthy, may be carefully cut back pretty severely so long as there is a good stock of young wood below. By this means an old plant may be renovated.

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The Orange-tree.

As a rule, Orange-trees will grow moderately well in form without much trouble, but when they are young some precaution will be necessary to prevent the plants getting deficient of branches below. The French people are very clever as gardeners in growing the Orange in a handsome and dwarf manner, bearing fine fruit on very dwarf and small plants. I have seen them, and have also had them with full-sized fruit on plants not more than eighteen inches high from the pot.

While the plants are young and growing fast nip out the points of the main shoots; this will induce a bushy and dwarf growth. During the summer an abundance of water must be given these plants, with a weekly watering of strong liquid manure.

Old Orange plants may be cut back occasionally to prevent them from getting overgrown. The best time to do this is early in the spring.

The Leucopogon.

This is a scarce though remarkably beautiful greenhouse flowering shrub of a dwarf habit. It is a woody plant of free growth, and flowers well during the early spring, producing an abundance of small spikes of diminutive wax-like white flowers, very delicate and beautiful, being well adapted for bouquets and for ladies' head-dresses.

The management of this plant consists in a constant stopping of the leading shoots while they are young to induce a dwarf growth, and for foliage close to the pot. Old plants may be cut back moderately, so as to reserve the young wood below.

The Pimelea.

P. Spectabilis is about the best of this tribe. It flowers freely, and has a very neat and good appearance. It is not at all difficult to grow, so that no greenhouse should be without it, the flowers being good for bouquets.

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While the plants are young, nipping out the points of the leading shoots is necessary to induce a full-developed plant below. It is needful to continue this nipping out in order to keep the plant well feathered with leaf and young wood below, for on the points of all fully matured young wood come the flowers.

The pruning of the *Pimelea* consists in cutting back all the growth that has borne flowers, pretty close to the base of the young wood, as soon as the flowering is over. Then thin out a little and stimulate the plant to give vigorous growth, and stop the leaders once or twice afterwards; then get a moderate growth and discontinue the stopping for the season, *i.e.* discontinue it after August.

The Inga.

There are many varieties of this tribe, but *I. Harrisii* is a very showy and peculiar plant. Its flowers are like a flower all stamens, but displaying themselves most gorgeously by expansion. They are rose-coloured, but lighter in the centre. It is a cool stove plant, and easy to grow, requiring only a low temperature during the winter. It grows freely and produces its flowers on the ripened wood of the previous year, similar to the *Acacia Armata*.

The pruning of this winter flowering plant consists in the cutting back as soon as the flowering is over, and then getting as much young wood on the plant through the summer as possible, which should then be well ripened before the winter.

There are other good varieties of this genus, mostly natives of the West Indies and South America.

The Euphorbia.

E. Jacquiniflora is about the best of this class, although *E. Fulgens*, *Splendens*, and *Punicea* are much alike; and probably the first-named one is *Fulgens*, or *Splendens*, so that I will select *Jacquiniflora* for my observations.

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This is a very showy and free-flowering variety, having bright scarlet flowers. It will grow to a large size in a warm greenhouse, but the plant requires stopping while young to induce a branching habit, and the leaders also require frequent stopping. In doing this there is some danger of the plant bleeding, therefore when it is cut a lighted lamp supplied with benzoline should be kept close at hand, and the moment it is done some red sealing-wax should be immediately placed on the cut quite hot, holding the lamp and wax close to the cut, in which case the danger of bleeding will be avoided.

The Fuchsia.

I have not much occasion to say anything here about the Fuchsia, for, as a rule, the habits and culture of this genus are well known; but as there are exceptions to every rule, so it happens in reference to this plant. And here, for the better information of any reader who cannot correctly spell the word *Fuchsia*, I beg to refer to its origin. The name is derived from that of the man who either found it and introduced it from seed or otherwise. *Fuchs* was his name, and the "ia" was added just as we now attach two i's to a seedling of any new plant, or to one newly found.

Fuchsia fulgens, minor and major, are certainly a distinct species, although the word *fulgens* applied no doubt originally to the whole genus, as it refers to the colour, which means "shining red," that being the colour of the variety first introduced. Some say that *fulgens* refers to the disposition of the flower, but as a rule it means shining or glowing, scarlet or red, which, as I have already said, was the original colour of the Fuchsia. They are a very beautiful species. *F. Major* is one of the grandest flowering species of this genus, and when grown to a standard with a clean stem of six feet, and the plant induced to form a good head from which numerous corymbs of flowers are suspended, it forms a fine floral object. It is necessary to form a good symmetrical head of say six or seven main

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branches, then to keep these as a sort of framework from which laterals are emitted on which will come the flowers in the autumn. As soon as these laterals have done flowering, or during the winter, spur them in to a bud or two.

Old Fuchsias should be cut back to the base of the laterals which spring from the main leader during the winter or in the early spring, and induced to make a vigorous growth from these spurs. In most cases two or three year old plants will make as fine flowering specimens as one year old plants.

The Geranium.

There are three or four distinct classes of the Geranium. There is what is called the "Fancy," the "Zonal," the "Bicolor," and the "Tricolor." The first are the general favourites, but the second are beautiful specimens for cutting for bouquets and for bedding; while the last-named are among the most striking and peculiar in the genus.

Now each of these divisions requires a somewhat different management in regard to the cutting of them. The Fancy kind must be cut back annually after flowering, let that be when it may; *i.e.* if this has taken place early and flowers are wanted in the following year, cut them back as soon as the flowering is over. This cutting back, or cutting down as some call it, consists in doing so as far as the base of the last growth, leaving a good bud at the base on which dependence may be placed for a strong shoot as the basis of a good plant for the next year. As soon as these have made an inch and a half of young growth nip out each point. This will induce several laterals to issue on the base of it, and each of these may be stopped again as soon as they get two inches long.

The stopping or nipping out of the young growth must be discontinued fully two months before they are required to flower, or even more. The stopping or nipping out of the leaders retards the flowering season;

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but as *Pelargoniums* cannot be made dwarf, and a well-feathered plant below cannot be had without this nipping out of the main shoots, some of it must be done.

The same kind of routine is necessary for the Zonals and Common Scarlets for pot work, although there is not half the difficulty attending these as there is with the "fancy" kind, nor is there, perhaps, quite so much stopping required with old plants as with young ones.

As regards the "Bicolors" and "Tricolors," a somewhat different plan must be adopted. Very old and strong plants of the Tricolor class may be cut back pretty freely if they can be subjected to a moderate heat afterwards, or else only a very moderate cutting back must be done. The safest and best plan to adopt with them is to commence, while the plants are young, to nip the points out and grow them in a good heat with a weekly watering of weak liquid manure.

The climbing ivy-leaved sort requires a different kind of management still; these must either be trained on the trellis, or up the pillars of the house, or on trellises in pots. In any case, some cutting back of the chief leaders must be resorted to occasionally, to prevent the plants getting barren of leaf and flowers below.

The Gardenia.

The pruning of the *Gardenia* may be assimilated to that of the Camellia, for both of them bear their flowers upon the preceding year's growth, consequently whatever cutting back and pruning are required must be done immediately after the flowering is over. Cutting back is necessary to prevent the plants getting barren of foliage below; but in doing this, care should be taken to cut to some laterals, and these will give out sub-laterals which will fill up the plants with flower-buds in abundance.

The *Gardenia* is an especial favourite with the ladies, but the time is past when a guinea must be given for a single flower bud, for the growers of them have found out how to get these flowers at any time and in such

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abundance that a shilling is reckoned a good price for one now. In the United States of America the hedges are frequently composed of *Gardenias*.

The Andromeda.

The *Andromedas*, like the Heaths, produce their flowers upon the matured wood of the preceding year, or the matured young growth of the current year; therefore the cutting back must be done immediately after the flowering is over, and the plants must then be encouraged to make new growth for the ensuing season.

The Andromeda is a beautiful class of free flowering shrubs. Some are dwarf, free flowering and hardy, such as *A. Floribunda*. Some are handsome greenhouse shrubs, as *A. Phillyreæfolia*—a beautiful variety producing pure white flowers on a very dark green foliage which gives it quite a charming appearance. It should be in the possession of every lover of what is good in floriculture; and there is no plant better suited for cutting.

The Ixora.

The *Ixoras* are a wonderful class of flowering shrubs, producing amazing heads of flowers. They embrace many shades of colour, some being of a pure white, others deep red, whilst others are of an intermediate shade. They are all stove shrubs with an evergreen foliage. They produce their flowers upon the current season's growth, forming a terminal head of flower, therefore all cutting in and pruning must be done as soon as the flowering is over, otherwise the flower-buds will be cut off if this is deferred till long after the new growth is made.

The Leschenaultia.

These are a beautiful class of New Holland plants, of free flower and dwarf habit, and are of remarkably

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easy culture. No greenhouse should be without one or two of these, well trained over an eight or nine inch pot. When I say "trained," I mean that the plants should be constantly stopped while they are young, to induce them to grow equally on all sides, so as to make a symmetrical and full specimen, covering the top of the pot and hanging a few inches over the rim, and not, as we generally see them, growing on one side only, and without shape or form. There is nothing among greenhouse plants capable of exciting more interest than a well-grown *Leschenaultia* when in full flower.

Particular attention must be paid to the stopping or nipping out of the points of the leaders while the plants are young. I repeat this, because it is the only remedy against a plant growing one-sided and thin over the top of the pot. Young plants of a good description may be had of the nurserymen for from 1s. 6d. to 2s. 6d. each.

The Lantana.

These are a very showy class of greenhouse plants, and are useful for bedding purposes. The plants must be frequently stopped while young to induce a dwarf habit.

The Siphocampylus.

These are a splendid class of stove or warm greenhouse flowering half woody and half succulent plants, of a tender nature and of free growth. They have also fine foliage, and are conspicuous objects, well deserving of especial culture. They are very much like *Salvia Fulgens*, except that the flowers are longer and more beautiful. I refer more particularly to *S. Coccineus* and *S. Lantanifolius*, two old but handsome varieties. They should be cut back as soon as they have done flowering.

The Justicia.

These are a conspicuous and beautiful class of flowering greenhouse shrubs. They should be pruned as

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soon as they have done flowering, and the plants induced to make a moderately strong new growth afterwards, without applying strong stimulants in the shape of liquid manure, as this would produce too strong a growth in some of the free-growing sorts, such as *Coccinea.*

The Kalosanthes.

The *Crassula* of some, which means a plant with a "thick leaf." It is a thick-leaved greenhouse succulent plant, of great beauty when in flower. *Kalosanthes Coccinea,* or *Perfilata Miniata* of some, is a superb plant. Some little attention is necessary with this when it is young, in order to obtain a fine and symmetrical specimen. I have had it as large as two feet in diameter and as much in height, symmetrically grown, and full of fine flowers; but if it is not duly attended to when young, or even when it has become an old plant, it will grow very awkward and never make a handsome plant.

The cutting from which a well-formed specimen may be expected must be a short one; and when it has struck, stop it, so as to induce an equal branching out on all sides. Then tie these laterals out to sticks, so as to form a symmetrical plant. Continue these as a permanent framework, and induce them to branch out again, so as to fill up the body of it. As soon as it has down flowering, cut the laterals back to an inch of their base, and subject the plant to a little warmth to induce it to break well, then keep it cool and dry.

Old plants may be cut back pretty severely, but occasionally some difficulty is experienced in getting an even and healthy growth from very old ones that have been neglected. Saving these few difficulties, the *Kalosanthes* may be grown by any one.

The Cactus.

The *Epiphyllum* and *Cereus* classes of this genus may require some occasional pruning, such as cutting

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back old worn-out parts that have done flowering to make room for the new ones. This will be necessary in order to maintain a sufficiently thin plant, so that the parts may thoroughly ripen, and to make room for the proper development of the flowers.

The Coleus.

I need not give any long description with reference to the Coleus, as every one must be acquainted with its handsome appearance and its fine foliage. Nevertheless, it is useless for any one to attempt to grow these plants through the winter if they cannot place them in a warm glasshouse, where a heat may be maintained at 65° or from that to 70° Fahr. They are remarkably handsome bedding plants, and there is nothing to excel the various kinds of the Coleus as fine pot plants for the conservatory or for table decoration. They will grow with ease to large specimens in the course of one season. One precaution is, however, very necessary, and that is, for those who may happen to begin to grow them, and who wish to obtain handsome plants, to commence nipping out the points of every lateral springing from the main leader as soon as they have grown four inches long, or have made two leaflets, reserving the second leaflet. These will then each give a sublateral, and these again must be stopped, and continue to do so until a well-developed plant is formed. Old plants may be cut back severely, and subjected to a good heat, when they will form extra fine specimens.

The Petunia.

The conspicuous and beautiful double and variegated flowers in this class render it a general favourite. The Petunia has of late years gained a reputation which it is not likely to lose, and as a pot plant it stands remarkably well.

While the plants are young particular attention must be paid to the nipping out of the points of every

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young shoot made, to prevent them from becoming thin and lank specimens. The Petunia does not require much heat at any time; to the fact that too much is given, and want of sufficient light, may be attributed the poor plants we often see. A good light, a temperature as cool as is consistent with safety and the promotion of a healthy growth, good pot and house room, with constant stopping of the shoots, must necessarily result in fine specimens of a superb class of ornamental plants not to be surpassed.

The Calceolaria.

There are two classes of the Calceolaria, as most people know, and each of these requires different management. The Shrubby Calceolaria must be constantly stopped, to get a dwarf and handsome specimen as a pot plant. This nipping out of the points of the shoots may be continued as long as you please, for the Shrubby kinds will flower under almost any circumstances; but, as a rule, the stopping may be discontinued in May, when the early autumn-struck plant should have arrived at a fair size, and be of a symmetrical character, so as to produce a fine bold flowering specimen through the following summer for a vase or a pot.

Old and healthy plants may be cut back moderately, and kept for two or three years for vase or pot work.

The Herbaceous varieties must never be stopped, or the plants will be spoilt; nor must the Cineraria ever be stopped under any circumstances.

The Chrysanthemum.

No one can obtain a fine specimen of the Chrysanthemum unless a constant nipping out of the points of the leaders in the first instance is done; and, in the second place, every lateral must be regularly nipped out as soon as it has made two inches of growth. This practice must be absolutely followed as long as it is practicable, which may be until the middle or end of

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July, when it should be discontinued. It is necessary to do this to induce a handsome and dwarf habit, and also to get a full plant in a pot. At no time must the Chrysanthemum be allowed to suffer either from water or from a want of it, otherwise the foliage will suffer below, or it will altogether fail.

The Polygala.

P. Dalmaisiana is a pretty growing and a handsome flowering variety, and is well worth a place in every conservatory, on account of its freedom in flowering and the value of its flowers for bouquets and vases. It bears these on the current year's wood, *i.e.* a bunch of flowers comes on every few inches of new growth as the new shoots are made through the season.

Young plants should be frequently stopped, and old plants may be cut back pretty close and new growth made. If the early stopping of the leaders and first laterals are not well attended to, no one can obtain a dwarf, full, and handsome specimen.

The Corræa.

These are all beautiful evergreen greenhouse flowering shrubs of a moderate growth, with handsome flowers of the shape *Cuphea Platycentra*, only larger; moreover, they are not of the same order. I merely mention this as a comparison, that those persons who may not know the Corræa may form some idea of it. If I were to use the type of the natural order for this genus, which is the Rue, no one would see much resemblance in the Rue flower to that of the Corræa. The latter bears its flowers upon the wood of the previous season's growth; therefore when it requires pruning it must be done immediately after the flowering is over, and a new growth induced at once by stimulants, heat, and liquid manure.

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The Genista.

I have referred to this genus under the general head of "Hardy Shrubs," but have not, I think, included the one I am about to speak of as a pot plant. *G. Canariensis* is one of our earliest and best spring greenhouse plants. It produces its flowers in abundance upon the ripened young wood. In cutting back or in pruning this lovely shrub, let it be done as soon as the flowering is over, and then induce a free growth through the summer, frequently nipping out the points of the leading shoots.

Old plants may be severely cut back and a new growth induced by stimulants, and in this way an old plant may be renovated. For those who do not object to the yellow colour, there is no plant grown which is better adapted for early cut flowers than this.

The Mitraria.

Mitraria Coccinea is a fine greenhouse shrub which I am convinced is hardy enough to be grown out of doors in our western counties, especially about Torquay, Exmouth, &c. It is a handsome flowering shrub, bearing an abundance of *gesneraceous* flowers of a peculiar and pendant character. If it is kept thin by pruning and induced to make a good growth annually, I know of no plant that will produce a more singular and unique effect than this when set upon a pot turned up—an inverted eight-inch one will do—set on it so as to elevate the plant. This will give it the advantage of showing its character when in bloom, the flowers being suspended from the branches on long foot-stalks, which give the whole thing a very good effect.

The flowers are produced upon the current season's growth, therefore the cutting back or the thinning of the branches should be done soon after the chief bulk of the flowering is over.

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The Shrubby Begonia.

There are a number of these, all being very desirable, warm, greenhouse or stove plants. All the Begonias may be grown in the common greenhouse through the summer months without any trouble, but none of them will do well in such a place through the winter without a moderate heat. They are beautiful things as a genus, but *B. Fuchsiodes*, *B. Chelsonii*, *B. Chambersii*, are among our best. *Chelsonii* is a splendid thing, but requires some attention in the stopping of the leader shoots to induce a neat and compact habit.

Begonias like a little shade as a rule, but if too much is given to *Chelsonii* it will become drawn and get thin. All the Shrubby Begonias must have the knife used to them pretty freely while they are young, to prevent them from growing too much at the extremities, and also to keep them dwarf and compact. The cutting back, however, must be done only during the early part of the growing season.

The Datura.

The Daturas are a noble, and some are even a splendid race of plants, but *D. Arborea* may be considered the best. This variety, as the word implies, is of a woody, tree-like nature, although it is a greenhouse shrub. This term applies to several varieties, but I now refer to *Floribunda*, a sort that is frequently grown on trellises in the greenhouse, and which blooms freely, producing beautiful horn-shaped, golden yellow flowers of a large size, measuring as much as five or six inches in length and an inch and a half in diameter; and even a small plant will flower when a few months old from the cutting, which latter will strike freely.

The annual varieties are all more or less noble plants, but the one I here allude to has no rival. It flowers upon the current season's young growth, consequently the pruning of the plant must be done soon after the flowering is over, or at least before it begins to make

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growth for the ensuing season. In the first instance, some main leaders should be trained out to form a permanent nucleus from which laterals will spring, to be spurred back, as for the Vine, year by year; these will give an abundance of flowers annually. It is necessary either that the plant should have a little dry warmth through the winter, or that it be kept moderately dry through the dull winter months. It is not particularly tender, but will not stand the frost.

The Aloysia Citriodora.

As a pot plant this is not very beautiful, but is useful, and a general favourite on account of its agreeable odour, which is given out on pressure. It may be grown out of doors against walls, and will stand through the ordinary winter; the chances are but very poor in severe winters for this plant, and I have no doubt but that every plant of this kind, both large and small, has been wholly destroyed this severe winter (1879) all through the country, let the situation be what it might, outside glass.

This old favourite may be grown easily, and if it is well nipped in while the plant is quite young it may be made considerably more attractive as a pot plant than is generally to be found.

Old and deteriorated plants may be cut back close and encouraged to grow freely, being stimulated by means of heat and liquid manure. It requires some annual pruning in all its stages to induce a compact and symmetrical habit.

The Coronilla.

As a pot plant the Coronilla has few equals. It is almost a perpetual flowerer, and with its coronated heads of flower and pleasing green leaf it is a very general favourite. To grow this in a compact and handsome manner the leaders must be nipped in while the plant is young. Old plants may be cut back

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severely, and they will break into new growth and form entirely new ones. The cutting back should be done in the early spring.

The Eutaxia Myrtifolia.

A genus with pea-shaped flowers of great beauty, which, however, chiefly depend upon the management of the plant. The plant should have especial attention given to it by stopping the leader shoots during the summer season, so as to induce a close and compact growth, when it will flower most profusely during the following spring.

The Heliotrope.

"Cherry-pie," as it is commonly called, is a most useful plant, both as a pot plant and for training on the back walls of the stove or warm greenhouse. Too much cannot be said in praise of this genus, but as it is so well known not much comment is needed. The Heliotrope generally is a straggling grower, and requires particular attention to the nipping out of the points of the leading shoots constantly, to induce a compact and full plant. Old plants may be cut in as you would prune a Rose, after which heat may be given them, and they will break into new growth freely.

The Veronica.

The Veronica will grow freely out of doors in the western counties of England—at least most of them will —but not in the northern counties. The half-hardy varieties, such as *Andersoni Variegata*, a beautiful striped-leaved kind, will not endure the cold of the north of England.

All the shrubby class require the constant nipping out of the leader shoots while the plants are young, to induce a compact and dwarf habit. Old plants may be cut back severely to renovate them and to get a new

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growth. I often see old Veronicas that might be made new and handsome plants by cutting them in severely. The pruning should be done in March or April.

The Boronia.

These are a genus of fine flowering greenhouse shrubs which will make a good display in the spring. Nipping back should be done in the summer after the flowering is over. These are desirable plants for cut flowers and for conservatory decoration.

The Bouvardia.

All the tribe of Bouvardias are useful and beautiful—what may be called dwarf shrubs—some of them being especially so. The flowers are above the common standard as regards their delicacy and chasteness of character, and are remarkably well adapted for ladies' hair ornamentation. They are generally known and grown for this purpose, and they will attain to a fair size by proper management, otherwise they are but poor things.

By the use of proper soils (peat, maiden loam, leaf-mould, and sand) and a good even heat from a stove they may be grown to a fair size, having a clean stem, and being crowned with a fine head. The stem will become woody, and may be maintained as such, and the branches cut in during the autumn, from which floral branches will issue annually, producing an abundance of flowers throughout the winter months or in the spring, according to treatment.

The Mignonette.

Some will, perhaps, wonder that Mignonette should be included in a work on pruning; but I know of scarcely any flowering pot plant that requires more attention to thumb-and-finger pruning than the Mignonette, with a view to ultimately obtaining a good speci-

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men. Let any one try to get a pot of good Mignonette without a constant nipping out of the leaders, and a short time will soon prove how futile is the effort, however good all the remainder of the treatment may be, soil and situation included.

As soon as the plants have grown two inches above the soil nip out the point, and do so again as soon as every lateral has made two inches of growth. Continue to do so till you are satisfied that the framework for a good, full, and symmetrical specimen is formed.

The Jacobœa.

Here is another plant that can never be made a handsome specimen unless due attention is paid to the thinning and the nipping out of the leaders; then I scarcely know of a more beautiful specimen for the greenhouse than the double crimson and double purple kinds. As soon as the plants are two or three inches in height, nip out the points of the leaders, and do the same with the laterals till a symmetrical plant is formed.

The Schizanthus.

These are annuals, but *S. Retusus* is no doubt one of the finest pot plants imaginable when sown in August, and grown as a greenhouse plant through the winter. The seed should be sown in the pot in which it is to flower, or if sown in five-inch pots, thinning out all the seedlings but one in the middle will be necessary. Then it must be shifted as soon as the roots fill the pot into a seven or eight inch pot, in which it should flower. While the plants are young, and through the winter until February, continue to nip out the points of the leaders and leading laterals. Then a full and handsome specimen will be formed, which, when in flower (which it will be by March or April), will be excelled by no other plant as regards its beauty.

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The Violet, Viola, and Pansy.

All these should be cut over, as we call it, once a year, to maintain compactness of character as well as to strengthen the plants. There are many amateurs who do not understand the professional way of annually propagating these flowers, or else they do not care to take the trouble to do so, and who thereby lose their stocks, which otherwise they might save. The plainest and easiest method is to cut all the old rambling growth clean off from each plant.

The Violet should have all the stuff cut clean from it during the summer, say from May until August, so that each plant may have time to re-feather itself with foliage before the winter.

The Viola may be treated in the same way in the spring; and the Pansy should be done in the same manner in September, and then be top-dressed.

Unless these flowering plants are cut over once a year, or are professionally propagated annually, they will soon wear out and be of no value whatever.

The Wallflower and Antirrhinum.

Double Wallflowers and Antirrhinums should be cut back once a year to prevent them getting barren below, and this applies especially to the Wallflower. The cutting back should be done as soon as the flowering is over. Many persons do not like to do this, but it must be done year by year, and then there will be no loss, either as regards the beauty of the plant or of the flowers in the following season. The Antirrhinum may be cut quite back, when a succession of fine young growth will come on, ready for the following season's flower.

Thrift and London Pride (*Saxifraga Umbrosa*).

As edging plants these are very beautiful and useful for many inexpensive gardens, but it is necessary to

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cut them in on both sides once a year, to keep them close and within the limits of what it is desirable they should be, as neat flowering edgings. This cutting in may be done either in the autumn or the spring, but I should prefer the month of July or August in which to do it.

Miscellaneous Plants.

There are numerous other plants used for edgings, &c., nearly all of which require trimming in annually, or nearly so, such as the *Golden Feather*, *Daisy*, *Sedum*, *Veronica*, *Iberis*, *Koniga*, *Peristrophe Angustifolia*, *Strachys lanata*, *Thyme*, &c. All these require more or less annual cutting in, or they will soon get out of order for such a purpose.

In concluding these remarks on the subject of pruning, I would observe that there are many plants which are not mentioned here which will require nearly similar or, in some cases, precisely the same management as regards the cutting in or pruning as those enumerated above, and severally treated under this head, the rules concerning which may be consulted when necessary.

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PART VI.

ON MANURES, THE DISEASES OF FRUIT TREES, ETC.

Manures.

As Manure is an essential article in horticulture and floriculture, I think it not out of place, but rather to the purpose, to give a few hints to those amateurs who may not be well acquainted with the best kinds to use for particular plants. And although this is not strictly a treatise on growing trees and plants, yet the cultivation and pruning of them are so closely connected, that Manures and Soils form an important element in such a work, for if there is no growth there can be no necessity for pruning.

Almost all trees, shrubs, and plants require an annual manuring to maintain them in good health. Even forest trees require it, and get it too in the woods and forests, by the annual decay of the fallen leaves which cover the ground.

Decomposed vegetable matter seems to be the best adapted to trees and plants; and perhaps old cow-dung may be considered as a very suitable manure for a top-dressing for such as require this kind of treatment, after they have exhausted the roots by flowering and bearing a crop of fruits.

In reference to the Grape Vine, I have no doubt but that fresh cow-dung is one of the best manures to lay on the surface of the ground for that fruit-bearing plant, whether it is indoors or out of doors.

As regards the Peach and the Plum, much depends upon the nature of the subsoil and the staple soil as

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well as upon the disposition of the tree. If the subsoil is of a rich alluvial clay, deep and nutritious, and the surface soil is good and upon the whole of a close texture, and the trees are young or even of medium age, and are disposed to give luxuriant growth, or only a good average medium growth, then no top-dressing will be required; but if the soil is poor and the trees are of only a medium or weak disposition—which is always shown, first, by the smallness of the young wood it makes, and, secondly, by the smallness of the fruit—then top-dressings of thoroughly decomposed stable dung and pulverised cow manure may be put on the borders from March until May, but not before March, unless the situation is exceptionally dry and gravelly, in which case they may be put on from January until April.

The Pear seldom or never requires top-dressings, for as a rule it always grows too free. Apples, especially old Apple-trees, require them frequently, using any strong manure. Fig-trees are like Grape Vines, and require good stimulants and all the sunshine the roots and branches can possibly get, with top-dressings of any decomposed manure, which should be laid on during the spring.

Gooseberries require a heavy top-dressing of any kind of fresh manure from the common sewer or cesspool, put on from November until January. The same may be done with Black Currants, and also Red Currants if they are weak.

Raspberries require a top-dressing as well as manure forked in if the land is dry and poor.

As a substitute, liquid manures may be applied to any of the trees above named, especially if they are in pots. This may consist of the contents of the cesspool put on while the trees are growing. It may be used in its original strength or diluted with pure water, according to the constitution and character of the object it is used for.

For Peaches and Plums on walls growing out of doors, care must be taken that the circumstances of

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the case are well considered; but as a rule these will not bear very strong stimulants when so situated, as they generally make too much growth and have to be checked. When, however, they are old and appear to be weak, some strong liquid manure may be given them once or twice during the early growing season, say from May until July. It should be poured on the border and allowed to soak down; it is not at all necessary to pour it directly upon the roots close to the stem of the trees, but all over the border, and at a distance of six or eight feet from the stems. I have often been amused when I have seen manure applied in great abundance to a Vine quite strong within a radius of a couple of yards from the stem. "Poor Vines," thought I, "this will do you no good, but will ultimately kill you." I wish the theory of physiological botany was more studied by our young professionals —and some of the old ones too—then they would know full well that manure put only just about the stems of such trees as the Fig, Plum, and Peach, as well as the Vine, is of comparatively little use, especially in the case of trees that have been planted ten or fifteen years.

Let those who have Vines planted remember that as they advance in age so they progress and extend their feeding spongioles, or extreme roots, in search of nutriment; nor will they be confined within the limits of a few square feet. I have known Vines that have been planted in rich soil inside a vinery get through the front wall to the outside, and extend their ramifications some distance in the course of only two or three seasons from the planting, notwithstanding the soil inside was good. Therefore, whenever manure of any kind, whether it is solid or liquid, is applied either as a top-dressing or as an admixture with the body soil to established plants, let it be used all over the area, and for some considerable distance from the stems.

THE CONIFERÆ.—Even these and shrubberies, where there are any valuable evergreen kinds, are benefited by the application of top-dressings of decomposed

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vegetable matter, such as leaf-mould and peat; especially is this the case with flowering shrubs, such as *Rhododendrons, Kalmias, Azaleas, Berberis, Roses,* &c. The variegated Hollies especially will be benefited by good thick top-dressings of leaf-mould, more particularly if they have been recently planted.

Nothing suits Roses better than good top-dressings of decomposed stable dung put on from November until January.

Lawns.—We often have complaints about these becoming mossy, and are asked, "What can I do to remedy the evil?" The thing is too plain to be misunderstood. The lawn has become mossy through poverty, the land being exhausted. In such a case apply a top-dressing annually, consisting of old decayed stable manure, or moderate dressings with soot sown over the grass in March or April. Guano and Goulding's "special" may be sown over lawns which have become impoverished; but sand is useless, either to kill moss or to restore grass.

Guano will be found most beneficial to fruit trees of all classes when the plants are poor and weak and the soil is poor also; it must not, however, be used upon them during the inactive state of the trees, but during the commencement of the active state, say from February until July, April and May being the best time.

The Diseases of Fruit Trees.

As the diseases of fruit trees frequently have to do with the handling of them by way of pruning, &c., I think it most important to offer a few remarks in connection with this subject. I am more than ever convinced of the injurious effects of rashly and thoughtlessly digging the borders where Peach-trees and Plum-trees are planted, or even digging them at all. I agree with making good use of a south border under a wall carrying Peaches, Nectarines, and Apricots; and most people would be almost ready to sacrifice the fruit to obtain a good crop of very early Radishes, Potatoes, Dwarf French Beans, or Lettuce. I well know that the value

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of these is a great inducement to hazard the chance of a crop of Peaches; but, upon consideration of the ultimate effect upon the trees, I advise never to dig the borders more than six inches deep, or not to dig them at all, which no doubt is the safest course, unless it is very carefully done.* Some will, no doubt, remark that this is contrary to my directions in "Multum in Parvo Gardening." I confess that it is so; and at the same time I will substitute a plan which will give results quite equal in value to what can be obtained from the borders described in that work.

Strawberries of a good productive kind, judiciously planted and well managed afterwards, will produce nearly an equal amount as regards value; nor will they prove at all detrimental to the Peaches, as no digging will be necessary on the borders, and if the plants are kept clean and detached, the ground will get as much sunshine as is necessary for the well-being of the Peaches. The Strawberries should be planted not less than twenty inches apart every way. Never fork or dig the ground at all, but lay the manure on it, which may consist of maiden loam one part, old decayed manure one part, and lime one part. This is a good top-dressing for Strawberries and also for Peaches.

The injudicious digging of the ground where Peaches, Plums, and Apricots are planted proves a source of many fatal diseases to them. In some cases I see that it causes the stock to throw up suckers, and when this commences it occasions no end of trouble and generally proves fatal to the trees, as the difficulty of eradicating these suckers (which come close to the stem and from the stem below the surface of the ground) will be as bad as the retention of them. When once they get deeply seated a constant recurrence of them will generally take place. The fact is, that through digging about the roots and stem of the trees, the roots close to the stem get cut or broken so constantly that they naturally emit shoots, as also do the branches; and by cutting them off annually a set of spurs is

* It may be done with a short-pronged digging fork, and the borders planted; see page 7.

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formed below, towards which a natural current of sap flows, and it is a difficult thing to prevent this when once it is thoroughly established. It sometimes proves almost death to the trees to remedy this one evil, and it all arises from the mutilation of the roots by digging.

THE CANKER, OR GANGRENE.—This is a troublesome and in some cases a fatal disease. Some think it is caused by atmospheric influences, while others attribute it to the unsuitable state of the soil, and others again to the overgrowth of the branches. It seems rather difficult to determine which is the true cause, since not every variety of the same species is affected alike, although growing side by side. For instance, the Hawthornden Apple suffers more from this disease than most other Apple-trees; while some equally as delicate in character and growing upon the same spot escape, this sort generally gets it. Now, if it arose from atmospheric causes all would suffer more or less; if it is constitutional, then no one instance would be found exempt from it, which is not always the case, there being some instances in which no gangrene attacks this kind.

In my opinion, canker, or gangrene on trees arises not from anything in the air, nor from overgrowth, nor from pruning alone, but chiefly from the disagreement that exists between the state of the roots and the condition of the atmosphere; for instance, if the subsoil is too cold. It is something like a person living in a locality consisting of a cold clay, and which holds water, causing rheumatism and at the same time aggravating his appetite. The subsoil being so much below the heat of the air, and the roots not being in active operation with the demands of the branches, a weakening power exists among them, and, as a matter of course, those channels that are the weakest suffer first; hence a limb here and a limb there fails, there being perhaps some minor defect previously in that particular part, which becomes suddenly paralyzed, and, as a rule, gets beyond remedy. A bruise with the hammer, or a nail pressing against the branch, will produce the like effect,

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although it will be found that there is a difference between a cankerous wound and canker produced from natural causes.

Some localities are more conducive to canker than others, and when this is the case among Peaches or Cherries, and it becomes very troublesome, I advise one of two things; that is, either to abandon the growing of those kinds which are so much subject to the disease, or to spare no pains to adapt the soil to the well-being of the trees. The borders should be raised well above the level of the natural soil (especially if the subsoil is of a cold nature), and this should be first of all dug deep and have an abundance of lime rubbish turned into the bottom. It should also have plenty of this mixed with the soil.

Maiden loam and coarse sand may improve the soil, and if of a flat, cold, and clayey nature, a good proportion of peat and decomposed leaf-mould may be mixed in deep with it. These composts will, no doubt, render a soil which is too cold for stone fruit suitable and productive in other respects, and will also prevent canker.

In pruning and cutting off large limbs, as I have said before, trim the saw-cut over with a keen-edged knife quite smooth, and then paint it with a little grafting-wax just warm.

Insects.—Fruit trees of all kinds are exposed to the attacks of various kinds of insects. The Plum is liable to be attacked by the blue aphides, the Peach to the green and brown kinds, and the Cherry to that of the black kind. Each of these pests appears suddenly in myriads, and if not quickly dispatched they will so increase that they will soon dispatch the fruit on the tree. In the orchard-house they are easily got rid of by fumigating, but on walls in the open air this is not so easily done. Powdered tobacco is a good remedy, and so is tobacco-water, and the clean solution of the Gishurst compound, not too strong, will also prove effectual. A strongly impregnated solution of stone-brimstone will no doubt be as good as anything, when

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applied pretty freely to the trees by means of the syringe; but the chief thing is to apply the insecticide as soon as the aphides appear, and never to allow them to gain strength for a day; for the rapidity with which these aphides increase in the course of only one day is quite astonishing, and the bad consequences are equally as rapid, for the leaves and young shoots soon feel the effects of their presence.

THE RED SPIDER.—This diminutive pest is a troublesome one, and appears on Vines and Peach-trees during a dry atmosphere. Its presence is soon made apparent by a peculiar and mottled appearance in the leaves, which soon lose their healthy green hue. No time must be lost when this pest appears, but immediately apply the sulphur-water freely with the syringe. Ten or twelve pounds of stone brimstone broken up and put into a half-hogshead barrel without the head, with two pounds of soft soap added to it, then pour ten or twelve gallons of hot water on to the whole and stir it to dissolve the soap; let it stand for a day and a night, or as much longer as you can, then dilute it with clean water up to the half-hogshead; let it settle for a few hours and then dip out and syringe the tree infested overnight, and again with clean water in the morning if the fruit is getting to a good size. Clean water syringings will often arrest this pest if well followed up.

ON REMOVING FRUIT TREES.

I did not intend to say anything specially on this head, but as there will be a constant necessity for this in connection with the pruning and renovation of fruit trees, as well as for the greater convenience of the readers of this work, I consider it necessary to give a few hints to those who may require such information in order that they may avoid disappointment.

As I have remarked elsewhere in this work, it is no doubt really necessary that all gardeners, at the least, should be acquainted with the subterraneous action of plants, more especially as here lies their weal or their

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woe. I do not profess to be an expert in the matter of vegetable physiology, but this I conceive to be true, that all plants, especially fruit trees, depend upon the number and health of the spongioles, that is, the sponge-like young fibres at the ends of the roots. Now, if these are not healthy, owing to the state of the soil, some bad results will soon arise and show themselves in the branches, fruit, &c. If the subsoil is uncongenial to these tender fibres—if it is too cold and wet, and impervious to the fertilising rays of the sun, or wet and water-holding, and soured—bad results in the branches will appear.

It makes no difference even if the ground is manured never so well; it is even worse than it would be if the land were poor and the other conditions favourable. I have seen Grape Vines that have been fairly killed by giving them overdoses of rich manure, so much so that the roots were buried quite out of the reach of the sun's rays, and notwithstanding the richness of the soil the Vines pined away, simply because the tender spongioles or fibres at the end of the roots could not consume the surcharge of nutritious matter, and there being no evaporation by the virtue of the sun's influence; and still more so is this the case with the Peach and the Plum.

I have been consulted by a gentleman who has wall trees, including the Cherry, Plum, Peach, and Nectarine, which bear scarcely any fruit worth naming. Well, I soon discovered what is the cause—not poorness but coldness of the soil, and too much manure put upon the roots. With Peaches and Plums this is far worse than no manure at all under such circumstances.

Be it remembered that Peaches as well as Plums send out their spongioles and extend them in proportion to the requirements of the branches of the tree, in search of food to supply them with; and let young gardeners always bear in mind that the extension of these spongioles is ever on the advance year by year, for as they get older they become converted into mere channels of a more solid nature, and new spongioles are made on

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these in due time for the next season, and so the subterraneous action goes on year by year.

Few will credit the distance that the roots of trees will travel in search of food for the supply of the branches. I have noticed particularly that most kinds send out their roots a few inches under the surface of the ground, and this is the case with the Plum, the Apple, and the Peach. When the soil on which they grow is not dug, I have also found that the roots of Grape Vines will creep along a few inches below the surface, especially where the sun shines upon it. These facts go far to prove the necessity of giving the roots as well as the branches the benefit of the sun. I have further carefully noticed that when Plum-trees and Cherry-trees (and even the Pear) have been planted on north and north-west walls (which is frequently the case) that little or no fruit can ever be had from them. They grow freely enough, and there it ends; and I am more than ever convinced of the necessity for the careful study of physiological botany, or the underground action of trees, especially fruit trees.

A good slope facing the full sun all day is no doubt the best aspect for fruit trees in general, especially for the Pear, as the latter is more inclined to go deeper into the soil below than the stone fruits are. If the Pear is planted in a deep flat soil, the roots will penetrate deeper than they should, and the consequence is that they will grow too freely and bear less fruit; on the other hand, if planted on sharp slopes, the sun will get at the roots more readily, and the trees will not grow so freely and will bear abundantly.

Now, in regard to the lifting and transplanting of Peach and Plum trees, as they are treated in this work under their respective heads, I wish to say that, whenever it is necessary to do so, which will often be the case, as I have shown, and which must never be omitted when a Peach, Plum, or Pear gets to an overluxuriant state, especially under the close "cordon" treatment and "renovation" plan, let me advise that the "lifting" and "replanting" be done carefully;

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also to observe well to reserve as much as is possible of the fibres of the roots uninjured, unlacerated, and unbroken. Then take every care to lay these out in the hole made ready to receive the lifted tree.

It is in a great measure owing to the rash and heedless manner in which trees and shrubs are taken up and replanted that so many are lost. In the case of planting young trees, which have been obtained, it may be, from nurseries many miles off, allowance must be made; but I now more particularly refer to the lifting of the Peach on the spot, in order to check its too free growth.

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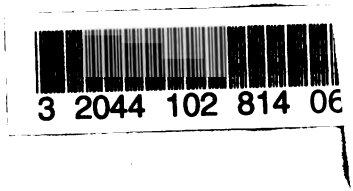
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